ALTON GEOSCIENCE

FILE

October 10, 1997

State of California Environmental Protection Agency
101 Center Plaza Drive
Monterey Park, California 91754

ATTN: MR. MANJULIKA CHAKRABARTI

SITE: MOBIL JALK FEE PROPERTY
10607 NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA
FILE NO. 90-60-47 (94)

RE: SITE ASSESSMENT REPORT/REMEDIAL ACTION PLAN

Dear Mr. Pao:

Please find enclosed our Site Assessment Report/Remedial Action Plan for the Mobil Jalk Fee Property, located at 10607 Norwalk Boulevard, Santa Fe Springs, California.

If you have any questions regarding this report, please call me at (714) 753-0101.

Sincerely,

ALTON GEOSCIENCE

John Frayseth for

Kevin M. Keenan, RG
Associate, Irvine Operations

Enclosures

cc: Mr. Steve Pao, Mobil Business Resources Corporation
Mr. Alan Dreher, Mobil Business Resources Corporation (without appendices)

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SITE ASSESSMENT REPORT AND
REMEDIAL ACTION PLAN
October 10, 1997

Mobil Jalk Fee Property
10607 Norwalk Boulevard
Santa Fe Springs, California

Alton Project No. 23-0134

Prepared For:

MOBIL OIL CORPORATION
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TABLE OF CONTENTS

SECTION 1
SITE ASSESSMENT REPORT

TABLE OF CONTENTS

SECTION II: REMEDIAL ACTION PLAN

TABLES

APPENDICES

1.0 INTRODUCTION

This report presents the findings of a supplementary site investigation, fate and transport modeling of residual chlorinated solvent and crude oil concentrations in soil, and a qualitative evaluation of risk posed by residual contaminants, and a proposed remedial action plan for the Mobil Jalk Fee Property, located at 10607 Norwalk Boulevard in Santa Fe Springs, California (Figure 1). This work was performed in accordance with California Regional Water Quality Control Board requirements (Agency File No. 90-60-47 (94) and the Alton Geoscience workplan dated May 13, 1997.

The objectives of this investigation were to:

- further characterize the distribution of previously identified solvent and crude oil contamination beneath the southeastern portion of the property;
- collect soil contaminant and physical parameter data in a purposive manner in order to obtain a defensible data set for use in fate and transport modeling and possible future use in quantitative human health risk assessment;
- perform fate and transport modeling of residual chlorinated solvent and crude oil concentrations in soil; and
- prepare a proposed remedial action plan for the southeast portion of the site.

2.0 SITE DESCRIPTION

The site consists of approximately 8.8 acres of undeveloped land located in the southwest portion of an active oil field. The site has been used for oil production from the 1920s to the present; the current tenant, Hathaway Company, has conducted oil production activities since the 1980s (McLaren Hart, 1994b referencing Levine-Fricke, 1991a and 1991b). Current and previous site structures include the following:

- Four active oil production wells (three along the northern property boundary [Well #s 111, 112, and 113] and one along the southern property boundary [Well #117]) are present at the site (Figure 2). Five additional oil production wells were previously abandoned (McLaren Hart, 1994b referencing Levine-Fricke, 1991b).

- A tank battery consisting of six above-ground tanks is located in the northwest corner of the site (Figure 2).

- Eight former sumps (mud pits) associated with oil drilling and production have been observed in historic aerial photographs (Levine-Fricke, 1991b).

- From approximately 1920 to 1942, a small oil refuse area (boneyard area) used for the storage of metal objects was present in the southwest portion of the property (Figure 2) (Levine-Fricke, 1991b).

- In the late 1920s and early 1930s, above-ground storage tanks were located in the southeast portion of the property (Levine-Fricke, 1991b).

Trucking operations were performed in the central portion of the site (Figure 2; dates unknown; McLaren Hart 1996c). The northeastern portion of the site was, at one time, leased to a company that used solvents (dates, additional details not listed) (McLaren Hart, 1994b).

Adjacent properties have been developed for industrial and commercial use. The Continental Heat Treating, Inc. facility, located adjacent to the southeastern property line of the site, uses tetrachloroethylene (PCE) for business operations. The company has been operating at this location since 1969 (McLaren Hart, 1993).

An ongoing groundwater characterization study is being conducted by the Oil Field Reclamation Project (OFRP) on approximately 272 acres of undeveloped land adjacent to the site to the northeast (Figure 3). Area B of the OFRP project is located approximately 750 feet northeast (upgradient) of the Jalk Fee Property. The results of the OFRP study suggest that dissolved-phase hydrocarbons have impacted groundwater regionally with volatile organic compounds (VOCs) including benzene, PCE, and TCE and semi-volatile organic compounds (SVOCs) including phenolic compounds (McLaren Hart, 1996b).

2.1 HYDROGEOLOGIC SETTING

According to the McLaren Hart September 20, 1996 report, the Santa Fe Springs Oil Field is located on the Santa Fe Springs plain, which is part of the Montebello Forebay non-pressure area of the Central Basin. Groundwater is found throughout the region under unconfined conditions in the Recent Alluvium and in the underlying Exposition Aquifer. Within the Santa Fe Springs Oil Field, the upper 100 feet of sediments consist predominantly of permeable sands, although the upper 15 feet of sediments have a higher silt and clay content and lower permeability. According to the California Department of Water Resources (CDWR) Bulletin

104 (1988), the first regional groundwater-bearing zone is the Exposition Aquifer, which is first encountered at approximately 60 fbg. The second regional aquifer is the Gage Aquifer, first encountered at approximately 110 fbg.

The McLaren Hart report states that the Los Angeles County Department of Public Works (LACDPW) has information on a well (number 1625-N) located approximately two-thirds of a mile northwest of the Jalk Fee property, at the intersection of Telegraph Road and Norwalk Boulevard. Groundwater in this well was measured at 58 fbg on April 30, 1992, which corresponds with the top of the saturated portion of the Exposition Aquifer.

According to the McLaren Hart September 20, 1996 report, significant hydrologic features in the area included the San Gabriel River, which flows approximately north-south along the western edge of the city. There are also two extensive water spreading grounds/percolation basins approximately 1 to 2.5 miles northwest of the city limits. These features will act as groundwater recharge, or "mounding" areas, thus inducing groundwater flow away from them.

3.0 CHRONOLOGY OF PREVIOUS SITE ASSESSMENT ACTIVITIES

In August 1988, a geophysical survey, surface soil sampling, and a soil boring program were partially completed at the site (Figure 4). The results of this work indicated that solvent vapors were detected in borings drilled in the eastern portion of the site (McLaren Hart, 1994 referencing Woodward-Clyde, 1988).

Between November 1990 and September 1991, a total of 27 borings (inferred SB borings) were drilled at various locations within the property to depths ranging from approximately 20 to 55 feet below grade (fbg). Additionally, several trench excavations were completed in the former boneyard and in 8 former sump areas, and a shallow methane gas survey was conducted. Maximum concentrations of 2,500 parts per million (ppm) PCE were detected in trench soil sample T9A-1A, located in the southeast portion of the property, at a depth of approximately 4 fbg. A maximum concentration of 29,000 ppm petroleum hydrocarbons (C5 to C30) was detected in a soil sample collected from the southeast portion of the property. A concentration of 0.037 ppm PCE was also detected in a surface sample collected along the northern property boundary (SS-1) (McLaren Hart, 1994b referencing Levine-Fricke, 1991a and 1991b).

Groundwater Monitoring Wells MMW-3 through MMW-5 were installed at the Jalk Fee site in January 1994. Two additional groundwater monitoring wells (MMW-1 on the Mobil DeWenter/Jordan/Green property and MMW-2 on the Baker/Humble property) were installed in nearby properties in the Mobil Operated Santa Fe Springs Oil Field. These monitoring wells were installed to assess whether past oil production activities have impacted groundwater beneath the sites (McLaren Hart, 1994a).

In May 1994, soil treatment was initiated in two bioremediation cells (Cell #1 and Cell #2) at the site. Soil in the bioremediation cells was derived from properties in the Mobil Operated Santa Fe Springs Oil Field including Jalk Fee (720 cubic yards), DeWenter/Jordan/Green (23,000 cubic yards), Baker/Humble (8,950 cubic yards) properties, and Oil Well 732-C site (1,600 cubic yards) (McLaren Hart, 1994a & 1995). Confirmation soil samples were collected from the cells in December 1995 (McLaren Hart, 1996c & 1996d), and closure of the bioremediation cells was received in April 1997 (RWQCB, Los Angeles Region, letter dated April 9, 1997).

Between July and September 1994, a total of eighteen Geoprobe borings (GP-1 through GP-18) were advanced at the site to total depths ranging from 30 to 48 fbg in the southeastern portion of the site. PCE was detected in Boring GP-6 at a depth of approximately 15 fbg (maximum concentration of 55,000 ppm). The maximum concentration of 27,000 ppm TRPH was detected in Boring GP-1 at a depth of approximately 20 fbg (McLaren Hart, 1994b).

In December 1995, additional site assessment activities included the drilling/advancement of:

1) A total of 15 Geoprobe borings (MH-2, MH-4 through MH-6 through MH-9 [northwest portion of site], MH-10 and MH-11 [northeast portion of site], and GP-19 through GP-24 [southeast portion of site] to total depths of up to approximately 40 fbg (Figure 4);
2) One continuously sampled Geoprobe boring (Macro) to a total depth of approximately 42 fbg in the southeast portion of the site (Figure 4);
3) 20 hand auger borings to total depths of approximately one fbg in the vicinity of the former Bioremediation cells;
4) Two hollow-stem auger borings (MB-1 and MB-2) to depths of approximately 60 fbg to further characterize the vertical extent of impacted soil in the southern portion of the site (Figure 4); and
5) 9 soil gas probes (SG-1 through SG-9) in the area of the former trucking operations in the central portion of the site to depths of approximately 5 and 10 fbg.

The maximum concentration of 4.1 ppm PCE was detected in Boring MB-1 at a depth of approximately 25 fbg. The deepest detected impacted soil (0.055 ppm PCE) was encountered in Boring MB-1 at a depth of approximately 55 fbg (maximum depth of investigation 59 fbg). Refer to McLaren Hart (1996c) for additional details.

4.0 SUMMARY OF RESULTS OF PREVIOUS SITE ASSESSMENT ACTIVITIES

Based on the results of previous site assessment activities:

- Soil contaminants beneath the site generally consist of halogenated volatile organic compounds (HVOCs; primarily PCE and TCE) and long chain petroleum hydrocarbons. Possible sources for HVOC-impacted soil include adjacent properties. Concentrations of petroleum hydrocarbons in soil likely relates to the site's land use history as a petroleum production field.

- Soil encountered beneath the site generally consists of silty sand, sandy silt, and silt from grade to approximately 40 fbg with interbeds of sand between approximately 10 and 20 fbg. Sand is generally present between approximately 40 and 100 fbg (maximum depth of investigation, based on boring logs from McLaren Hart, 1996b).

- Groundwater is present beneath the Jalk Fee site (MMW-3 through MMW-5) at depths ranging from 62 to 67 fbg, and the gradient beneath the site is approximately 0.0077 to the southwest (McLaren Hart, 1995, 1996b). Based on available data, historically, maximum concentrations of 2,200 ppb PCE and 180 ppb TCE were detected in MMW-5 in March 1995 (McLaren Hart, 1995). HVOC-impacted groundwater is likely affected by offsite sources.

4.1 Northwest Portion of Site and Tank Battery

In the northwest portion of the site, the maximum concentrations of petroleum hydrocarbons were detected in Soil Sample SS-3 collected in July 1991 at a depth of approximately 2.5 fbg. Hydrocarbon-affected soil in this area is likely of limited vertical and lateral extent, as additional borings completed in the vicinity of Boring SS-3 (e.g. MH-9 and SB-15) did not reproduce these results (McLaren Hart, 1996c).

Additional soil samples collected in the northwestern portion of the site indicated contaminant concentrations below laboratory detection limits or below cleanup standards (as presented in the CRWQCB, Los Angeles Region "Interim Site Assessment and Cleanup Guidebook" dated May 1996).

Based on these results, no further assessment or remedial action is warranted in the northwest portion of the site (McLaren Hart, 1996c, 1996d).

4.2 Northeast Portion of the Site

Soil samples collected in the northeastern portion of the site indicate contaminant concentrations below laboratory detection limits or below cleanup standards (as presented in the CRWQCB, Los Angeles Region "Interim Site Assessment and Cleanup Guidebook" dated May 1996).

Based on these results, no further assessment or remedial action is warranted in the northeast portion of the site (McLaren Hart, 1996c, 1996d).

4.3 Former Trucking Operations (Central Portion of the Site)

The soil gas survey conducted in the former trucking operations area (central portion of the site) indicated a maximum concentration of 3 ppb PCE in vapor. Based on these results, no further assessment or remedial action is warranted in the central portion of the site.

4.4 Southwest Portion of the Site

It is our understanding that an ongoing investigation is being conducted in the former boneyard area in the southwest portion of the site. Results of this investigation are pending by others.

4.5 Southeast Portion of the Site

The maximum concentrations of PCE (55,000 ppm) and TCE (2,700 ppm) were detected in Boring GP-6 at a depth of approximately 15 fbg (Figure 4). The maximum concentration of TRPH (27,000 ppm) was detected in Boring GP-1 at a depth of approximately 20 fbg (Figure 4).

The vertical and lateral extent of impacted soil has been adequately characterized (maximum depth of investigation 59 fbg in MB-1 and MB-2). Maximum concentrations of contaminants are generally present in localized areas between grade and approximately 20 fbg.

5.0 FIELD ACTIVITIES

5.1 DRILLING AND SOIL SAMPLING

From June 18 to July 13, 1997, 22 onsite geoprobe borings and nine soil borings were drilled to depths ranging from 17 to 62 fbg (Figure 5). No groundwater was encountered during drilling activities.

Soil samples were collected at 5-foot intervals using a California-modified split spoon sampler. Refer to Appendix A for details regarding general field procedures and boring logs. See Figures 6A and 6B for geologic cross sections of soil types beneath the site.

The soil samples collected during drilling were submitted to a state-certified laboratory and select samples analyzed for:

- TRPH using EPA Method 418.1;
- Carbon range speciation using EPA Method 8015;
- HVOCs using EPA Method 8260;
- Polynuclear aromatic hydrocarbons (PAH) using EPA Method 8310;
- CAM metals; and
- Organochlorine pesticides and PCBs.

Select soil samples were also analyzed for physical and chemical soil properties necessary to conduct a site-specific evaluation of vadose-zone fate and transport and human health risk evaluation. Soil data was collected in a purposive manner over a grid pattern to develop a quality data set for use in fate and transport modeling and possible future use in quantitative risk assessment modeling. All boring locations were surveyed professionally to a common benchmark to allow precise field location during possible future remedial actions.

Samples for the analysis outlined below were collected from a minimum of four laterally separate soil borings and from three distinct vertical intervals: 0 to 20 fbg, 21 to 40 fbg, and 41 to 60 fbg. The intent of this sample design is to quantitatively define the physical and chemical characteristics of the vertical soil profile which influence the fate and persistence of residual hydrocarbons in the vadose zone. Three of the four borings were completed in the area where the presence of the highest concentration residual chlorinated hydrocarbons has been identified by previous investigations. The physical parameters analyzed include:

- Fraction organic carbon;
- Moisture content, density, effective porosity, effective permeability, and effective air conductivity using ASTM D2216, API RP40, and EPA 9100; and
- Sieve analysis using ASTM D4464.

The results of laboratory analysis of soil samples are listed in Tables 1 through 5, and TRPH results are shown on Figures 7 through 10. Refer to Appendix B for copies of the official Laboratory Reports, Quality Assurance/Quality Control (QA/QC) Reports, and Chain of Custody Records.

5.2 ELEVATION SURVEY, FLUID-LEVEL MONITORING, AND GROUNDWATER SAMPLING

On August 1, 1997, well elevations were surveyed relative to an assumed 100 foot benchmark on the west curb of Norwalk Boulevard, and fluid levels in Monitoring Wells MMW-3 through MMW-5 were measured (Table 6). See Figure 11 for a groundwater elevation contour map.

On March 26, 1997, Monitoring Wells MMW-3 through MMW-5 were developed and groundwater samples were collected in accordance with standard regulatory protocol. Refer to Appendix A for a description of fluid-level monitoring and groundwater sampling procedures. Groundwater samples were submitted to a state-certified laboratory and analyzed for TPH-G, BTEX, volatile organics, metals, and water quality. The results of groundwater sample analysis are listed in Tables 6 and 7. Refer to Appendix B for a description of the analytical methods used, and copies of the official Laboratory Reports, QA/QC Reports, and Chain of Custody Records. Refer to Appendix C for a reduced copy of the official site survey data completed by Teipe and Associates of Anaheim California.

5.3 SOIL AND GROUNDWATER DISPOSAL

Approximately 6 cubic yards of soil cuttings and 300 gallons of water generated during drilling and sampling activities were stored onsite in Department of Transportation (DOT) approved drums pending disposal. Copies of the nonhazardous/hazardous waste manifests will be forwarded when available.

6.0 RESULTS OF FIELD INVESTIGATION

The results of this investigation are summarized as follows:

- The site consists of approximately 8.8 acres of undeveloped land located in the southwest portion of an active oil field. According to the McLaren Hart September 20, 1996 report, the Santa Fe Springs Oil Field is located on the Santa Fe Springs plain, which is part of the Montebello Forebay non-pressure area of the Central Basin. Groundwater is found throughout the region under unconfined conditions in the Recent Alluvium and in the underlying Exposition Aquifer. Within the Santa Fe Springs Oil Field, the upper 100 feet of sediments consist predominantly of permeable sands, although the upper 15 feet of sediments have a higher silt and clay content and lower permeability. According to the California Department of Water Resources (CDWR) Bulletin 104 (1988), the first regional groundwater-bearing zone is the Exposition Aquifer, which is first encountered at approximately 60 fbg.

The second regional aquifer is the Gage Aquifer, first encountered at approximately 110 fbg.

- Soil types encountered consist of silty sand from the surface to approximately 12 fbg, sandy silt and silt from approximately 12 to 23 fbg, a continuous clay interval from approximately 23 to 27 fbg, a sandy silt and silt from approximately 27 to 40 fbg, and a sand interval from approximately 40 to 65 fbg.

Results of laboratory analysis of groundwater samples collected on March 26, 1997 from the three onsite monitoring wells are as follows:

- Dissolved-phase PCE and TCE concentrations were detected in MMW-3 through MMW-5 (maximum concentrations of 1,100 and 88 ppb, respectively). 1-1, DCA and 1,1-DCE concentrations were detected in MMW-3 at 2.0 and 7.0 ppb, respectively; these constituents were not detected in MMW-4 or MMW-5.

- Dissolved-phase TPH-G concentrations were detected in MMW-5 (400 ppb); however no BTEX concentrations were detected in samples collected from this well. No TPH-G or BTEX concentrations were detected in Monitoring Wells MMW-3 and MMW-4.

- Maximum concentrations of background water quality compounds/indicators were 230 mg/l chloride, 25 mg/l nitrate, 230 mg/l sulfate and 1,400 mg/l dissolved solids. Of these results, dissolved solids exceeds the recommended maximum contaminant level (MCL) of 500 mg/l and upper concentration limit of 1,000 mg/l (CCR Title 22 secondary drinking water standards).

- A maximum concentration of 0.011 mg/l mercury was reported in CAM metals analysis results for MMW-3. This concentration exceeds the primary drinking water MCL of 0.002 mg/l for mercury (CCR Title 22 primary drinking water standard inorganic chemicals).

Soil sample results from borings completed during this investigation are as follows:

- Total recoverable petroleum hydrocarbons are present in soil in the southern and eastern portions of the study area of this phase of investigation. TRPH concentrations above 100 ppm extend from the surface to a depth of approximately 15 fbg (maximum 9,100 ppm in Boring GP-25 at a depth of 10 fbg). No TRPH concentrations above 100 ppm were detected below 17 fbg during this investigation. TRPH iso-concentration maps for 5, 10, and 15 fbg are presented as Figures 7, 8 and 9, respectively.

- Select soil samples containing both elevated and low-level TRPH concentrations were analyzed for polynuclear aromatic hydrocarbons (PAH). Results presented in Table 2 indicate that PAH are present in soil samples with elevated TRPH (>1,000 ppm) concentrations and can be correlated with the presence of elevated TRPH. A maximum single PAH concentration of 18,000 ppb phenanthrene was detected in GP-25 at a depth of 5 fbg.

- Residual chlorinated solvents in soil are present from grade to the total depth of this investigation (approximately 61 fbg at groundwater). During this investigation, concentrations of PCE in excess of 100 ppb were detected in 12 soil samples and concentrations above 1,000 ppb were detected in 2 soil samples (concentrations of 42,000 ppb in GP-40 at 5 fbg and 1,400 ppb in GP-31 at 35 fbg). All other soil PCE concentrations detected were below 100 ppb. Concentrations of cis-1,2-DCE in excess of 100 ppb were detected in 20 soil samples and concentrations above 1,000 ppb were detected in 2 soil samples (concentrations of 17,000 ppb at 16 fbg and 2,000 ppb at 31 fbg in HS-3). A maximum TCE soil concentration of 64 ppb was detected in Boring HS-2 at a depth of 31 fbg. Vinyl chloride was detected in two borings at the site, GP-37 (29 ppb at 16.5 fbg) and HS-4 (maximum concentration 16 ppb at 26 fbg).

- No CAM metals concentrations above background levels were detected during this investigation.

- No organochlorine pesticides or PCB concentrations were detected in soil samples analyzed for those compounds (except 31 ppb 4,4-DDT in Boring HS-3 at 51 fbg).

7.0 COMPARISON OF RESULTS WITH PREVIOUS INVESTIGATIONS

Results from previously conducted Mclaren/Hart investigations were used to delineate the area of investigation for this study. Data collected by Alton during this investigation are in general agreement with results from the 1996 Mclaren/Hart investigation, however, some significant discrepancies with the Mclaren/Hart 1994 data set were identified. Maximum concentrations identified by Mclaren/Hart in 1994 (55,000 parts per **million** and 27,000 parts per **million** PCE in borings GP-6 and GP-15, respectively, using EPA method 8010) could not be duplicated by Alton Geoscience in 1997, from borings drilled in the vicinity of the Mclaren Hart borings. Maximum PCE concentrations identified by Alton in these areas were 990 **ppb** in Boring GP-35 and 42,000 **ppb** in Boring GP-41. The Alton boring locations were located as accurately as possible based on Mclaren/Hart scale drawings. The discrepancy may be a result of reporting error in ppm/ppb in the 1994 Mclaren report.

8.0 SITE ASSESSMENT CONCLUSIONS

Based on the results of this investigation, Alton Geoscience concludes:

- Dissolved-phase PCE and TCE are present in the three onsite groundwater monitoring wells. An offsite upgradient source for dissolved-phase VOC's has been identified and is a likely contributing to the solvent plume present beneath the site.

- Total recoverable petroleum hydrocarbons are present in soil in the southern and eastern portions of the study area of this phase of investigation. No TRPH concentrations above 100 ppm were detected below 15 fbg during this investigation. The lateral extent of the shallow TRPH-affected soil is adequately characterized to the north, east and west by Alton Geoscience Borings HS-5 through HS-9, GP-26, GP-27, GP-28, GP-43, GP-42, and Mclaren Hart Boring GP-14. The TRPH concentrations have been characterized to the maximum extent possible to the south adjacent to the Continental Heat Treating facility. The data set collected during this investigation is sufficient to allow representative fate and transport modeling of the residual crude oil compounds.

- Detected PAH concentrations are associated with the TRPH (crude oil)-affected soil, and are generally present at TRPH concentrations above 1,000 ppm. These hydrocarbons have been characterized by simulated distillation (EPA 3550/8015) laboratory analysis to be crude oil range with carbon ranges from C-20 through C-40. ASTM guidance documents indicate that as the carbon range moves towards crude oil and carbon number increases (i.e., molecular size), the following properties are observed: lower water solubility, stronger adhesion to soils, and less mobility in the subsurface. In fact, aliphatic petroleum hydrocarbons with more than ten carbon atoms are expected to be immobile in the subsurface due to their low water solubilities, low vapor pressures, and strong tendency to adsorb to soil surfaces (ASTM 1994). Further vertical migration of these long chain hydrocarbons at the site will be limited.

- Low concentration (less than 1 ppm) chlorinated solvent concentrations were detected in all borings (except GP-45, and shallow borings HS-5, 6, 7, and 9 located to the north and west which were ND) installed during this investigation. Interpreted shallow surface release distributions with concentrations above or near 1 ppm within 5 feet of surface are present in the vicinity of GP-37, GP-38, GP-40, and HS-3. These source areas correspond with the Continental Heat Treating degreaser lines identified by Mclaren/Hart in the Addendum to Phase I Report dated September 27, 1996 (Mclaren/Hart, 1996e), and are adjacent to the Continental Heat Treating property. The shallow (5-15 fbg) source area chlorinated solvent concentrations are adequately characterized in all directions on the Jalk Fee Property. The erratic distribution and low concentration of chlorinated solvents detected in most other borings away from the Continental Heat Treating Facility likely result from vapor-phase and soil moisture dissolved-phase solvents migrating away from the identified source area through the heterogeneous soil column. The data set collected to date is sufficient to allow representative fate and transport modeling of the residual chlorinated solvents. Further lateral and/or vertical assessment of the low concentration adsorbed chlorinated solvents on the Jalk Fee Property does not appear warranted at this time.

9.0 ENVIRONMENTAL FATE AND TRANSPORT MODELING FOR CHLORINATED SOLVENTS

A review of the LARWQCB published Attenuation Factor Method indicates that it is not a vadose zone transport model and cannot predict any change of concentrations over time in the subsurface. Therefore, as recommended, an estimate of contaminant transport with time and depth was conducted using site-specific data and fate and transport modeling by use of SESOIL. SESOIL is an acronym for Seasonal Soil Compartment Model and is one-dimensional vertical transport code for the unsaturated soil zone. It is an integrated screening-level soil compartment model and is designed to simultaneously model water transport, sediment transport, and pollutant fate.

In order to determine the potential for residual chlorinated solvents in soil to impact groundwater, the environmental fate and transport of PCE, TCE and cis-1,2-DCE were modeled using SESOIL. The selection of these three solvent compounds was based on their prevalence and distribution in the subsurface at the site. In order to determine the potential for residual crude oil-range petroleum hydrocarbons in soil to impact groundwater, the environmental fate and transport of naphthalene was analyzed as a surrogate for crude oil-range hydrocarbons (TRPH). The selection of naphthalene as a surrogate compound for crude oil-range hydrocarbons result in the evaluation of an indicator compound which is typically more soluble and mobile than the majority of the hydrocarbons comprising the crude range. As a result of this conservative assumption, the qualitative and quantitative components of transport within the vadose zone are likely to be overestimated. For chemicals which travel in the dissolved-phase, parameters that affect migration include water solubility, Henry's Law constant, and molecular weight. A comprehensive overview of environmental fate modeling and a summary of the assumptions and methodologies incorporated into the environmental fate modeling are provided in Appendix D.

The SESOIL simulation was conducted for PCE, TCE and cis-1,2-DCE over a period of 150 years. The model was run on a 200 year simulation for naphthalene. Table 8 summarizes the SESOIL input parameters PCE, TCE, and cis-1,2-DCE. Appendix D details the rationale and input parameters used in the model and a brief summery is provided below. Due to the length of the output files (greater than 1,500 pages for each chemical), a complete "hard copy" printout of the SESOIL analysis is not included with this report. However, an abbreviated summary of modeling output is provided in Appendix E.

Data sources and conservatively assumed parameter values used in the SESOIL model simulation include the following:

- Climatologic data for the Brea Dam monitoring station located approximately 10 miles southeast of the subject property was used in the analysis.
- Bulk density and total organic carbon content were calculated from site-specific data.
- The highest site specific TOC value was eliminated from the data set to be conservative.
- The disconnectedness and effective porosity values were taken from the SESOIL soils database and assumed a loamy sand soil column (conservative soil type).
- Chemical solubility, Henry's constant, and adsorption coefficient on organic carbon were taken from chemical tables (Pankow and Cherry, 1996 and EPA,1990).
- To be conservative, it was assumed that no degradation/transformations were taking place.
- It was assumed that instantaneous chemical loading occurred based on no further chemical input from new sources to represent soil contamination already present.
- Application areas were approximated from Figures 8, 10, 11 and 12 depicting total lateral spread of the chemicals modeled.
- The soil column was divided into four distinct layers based on soil types, particle size distribution curves, and average depth specific intrinsic vertical permeability. Refer to a conceptual overview of SESOIL modeling for this site as shown in Figure 14.
- For the chlorinated solvent models layers one through three were not divided into sublayers. Layer four was divided into 10 sublayers in order to distribute the chemicals present in the lowest soil layer in a more proximal location to the water table. By dividing layer four into ten equal sublayers contaminants are within 32 cm of the water table at the start of the model run. The naphthalene model was run with each layer having 4 sublayers. This setup allowed steady time progression downward tracking of

the contaminants initially present only in the uppermost soil layer through the three lower soil layers.

- Initial chlorinated solvent contaminant concentrations for each layer were calculated as an average of all samples above 10 ppb for the given chemical within the defined lateral extent of the contaminant. Concentrations below 10 ppb were not used in the calculation to allow a conservative estimate of soil contaminant concentrations. The concentration used for naphthalene was 2,400 ppb (maximum detected soil concentration) for the entire crude-oil affected area. This value is very conservative as most borings in the affected area did not have detectable naphthalene concentrations.

- The impacted aquifer mixing zone was assumed to be a 10-foot thick silty sand with a saturated hydraulic conductivity of 864 cm2/day, a hydraulic gradient of 0.06, impacted aquifer widths of 53.34, 19.81, 28.96 and 19.80 meters for PCE, TCE, cis-1,2-DCE and naphthalene, respectively, and target background contamination levels of 0 for each chemical. This is based on typical aquifer properties for this site. By assuming no background contamination for the chemicals the model will measure any new chemical concentrations impacting the aquifer.

10.0 FATE AND TRANSPORT MODELING FINDINGS

Environmental fate analysis was conducted using the vadose zone chemical transport model SESOIL to simulate precipitation-driven migration of chlorinated solvents PCE, TCE and cis-1,2-DCE and the surrogate representative compound naphthalene for crude oil. Estimates of the lateral extent of solvent-affected soil and vertical distribution and concentrations of contaminants present in the subsurface were conservatively estimated based on existing site-specific data. Chemical-specific properties such as solubility, diffusion coefficient, Henry's Law constant, and organic carbon adsorption coefficient were obtained from a review of literature. Soil properties such as density, permeability, porosity, and disconnectedness index were conservatively estimated from site-specific parameters, default values provided by SESOIL, and published literature values. The SESOIL model simulations were conducted over a period of 150 or 200 years. A summary of the conclusions relative to the environmental fate modeling is provided below:

- Based on the model input parameters a maximum annual average PCE concentration in groundwater of 1.514 x 10-3 mg/ml (1.514 mg/l [ppb]) is predicted in year 119 of the simulation.

- Based on the model input parameters a maximum annual average TCE concentration in groundwater of 1.049 x 10-4 mg/ml (0.1049 mg/l [ppb]) is predicted in year 55 of the simulation.

- Based on the model input parameters a maximum annual average cis-1,2-DCE concentration in groundwater of 1.044 x 10-2 mg/ml (10.44 mg/l [ppb]) is predicted in year 42 of the simulation.

- Based on the model input parameters no impact to groundwater by naphthalene (crude oil surrogate) is predicted in 200 years. The maximum depth of naphthalene penetration is 17.99 meters (59 ft) in year 200 assuming no biodegradation or transformations.

- Based on the conservative input parameters used in the simulations, and from the soil contaminant concentrations detected on the Jalk Fee Property, the highest concentrations of dissolved PCE and TCE that are predicted to impact groundwater in the mixing zone are below the maximum contaminant levels (MCL) or the compounds. The predicted impact by cis-1,2-DCE is approximately 10 ppb, slightly over the MCL of 6 ppb.

- Current upgradient (MMW-3) background PCE and TCE solvent concentrations are 12 and 23 ppb, respectively. Predicted impacts for these compounds from the Jalk Fee Property residual soil concentrations are below the regional plume concentrations.

- Current downgradient/crossgradient (MMW-5) groundwater concentrations of PCE (1,100 ppb) and TCE (88 ppb), located proximal to the highest onsite soil chlorinated solvent concentrations and the Continental Heat Treating facility, are far in excess of values predicted to impact the top 10 feet of the aquifer in the next 150 years. The values detected in well MMW-5 showed increasing trends through 1994-1995. Concentrations declined from 2,200 to 1,100 ppb PCE and 180 to 88 ppb TCE between March 1995 and March 1997. The data is insufficient to conclude if a decreasing concentration trend has been established.

- Currently no downgradient/crossgradient (MMW-5) or upgradient background (MMW-3) concentrations of cis-1,2-DCE have been detected.

11.0 FATE AND TRANSPORT MODELING CONCLUSIONS

- The SESOIL modeling for the residual chlorinated solvent-affected soil present on the Jalk Fee property indicates that no further significant chlorinated solvent input to the dissolved-phase plume is predicted.

  Modeling of naphthalene as a conservative surrogate for crude oil indicates that no impact by crude oil contaminants to the aquifer is predicted.
- To be conservative the input parameters selected for the modeling disregard abiotic transformations and chemical hydrolysis. These factors would significantly reduce modeled residual concentrations for all chemicals modeled. These processes may be a factor in the current non-detection of cis-1,2-DCE in the aquifer.

- Results from the SESOIL modeling indicate that remedial measures, for the protection of groundwater, on the residual soil contaminants on the Jalk Fee Property are not warranted.

SECTION II: REMEDIAL ACTION PLAN

1.0 OBJECTIVE

The general objective of any remedial action is to reduce the toxicity, mobility, or volume of contaminated materials. This objective is designed to remediate hazardous materials in a manner that will protect both public health and the environment. The recommended goals for the remediation of the site are to reduce contaminant concentrations in soil to levels acceptable to the Regional Water Quality Control Board (RWQCB); and/or demonstrate by risk assessment, monitoring, or modeling that the leaching potential of the contaminants present are not significant, and therefore, pose minimal risk to human health and the environment. The remedial approach proposed for this site involves a combination of qualitative risk assessment of potential adverse health effects from site contaminants, coupled with the results from fate and transport modeling and a proposed contaminant source reduction.

With impending development of the site as the goal, the following objectives will be addressed in this remedial action plan:

- A qualitative evaluation of human health risk potential will be conducted; and
- Remedial measures to protect human health and the environment will be proposed.

2.0 SUMMARY OF FATE AND TRANSPORT MODELING

The fate and transport modeling for both the chlorinated solvents and the crude oil compounds (Sections 9.0 through 11.0 in previous part of this report) demonstrate that the residual contaminants on the Jalk Fee Property present an insignificant threat to groundwater.

3.0 QUALITATIVE RISK ASSESSMENT

In order to evaluate the potential for human exposure to residual solvent and crude components in subsurface soil, a qualitative evaluation of potential human exposure pathways was performed. The purpose of the exposure pathway evaluation is to identify, based on current and anticipated future site use, the potential for human exposure to affected soil to occur and to qualitatively characterize the potential impact, if any, on human health.

The qualitative exposure assessment consists of two main components: 1) characterizing the exposure setting and 2) identifying potential exposure pathways. In characterizing the exposure setting, it is important to depict the general physical characteristics of the site and the populations on or near the site (EPA, 1989b). Populations are defined and described with respect to characteristics that influence exposure (e.g., location relative to site). In addition, this step considers attributes of the current population and of potential future populations, which may differ under an alternate land use (EPA, 1989b).

The second step in the exposure assessment process is to identify potential exposure pathways. This component identifies those pathways by which human populations may be exposed. Exposure pathways are identified based on consideration of the sources, releases, types, and locations of chemicals at the site; the environmental fate of chemicals; and the location and activities of the potentially exposed populations (EPA, 1989b). Exposure points and routes of exposure are identified for each exposure pathway (EPA, 1989b). For a complete exposure pathway to exist, each of the following elements must be present:

- A source and mechanism for chemical release;
- An environmental transport medium;
- A point of potential human contact with the medium; and
- A route of exposure.

An incomplete exposure pathway is one which does not result in potential human exposure, and therefore, does not result in a significant risk. If a complete exposure pathway is identified, potential exposures may be quantified and risk evaluation performed or the exposure pathway may be eliminated through remedial mitigation. According to EPA (1989b), exposure pathways may be excluded from quantitative evaluation based on the following conditions:

- The exposure resulting from the pathway is much less than that from another pathway involving the same medium at the same exposure point;
- The potential magnitude of exposure from a pathway is low; or
- The probability of exposure occurring is very low and the risks associated with the occurrence are not high.

The exposure pathway evaluation presented in this report consists of a general text description and conceptual models.

3.1 IDENTIFICATION OF POTENTIAL HUMAN EXPOSURE PATHWAYS

The site currently exists as an unimproved, vacant lot, located in an area consisting of general commercial and industrial developments. Without consideration of the site-specific conditions, and chemical-specific properties, plausible routes of human exposure could include direct human contact with affected soil, ingestion of drinking water from the near-surface aquifer, and inhalation of vapors from subsurface affected soil. Sections 3.1.1 and 3.1.2 identify and evaluate potential site-specific exposure pathways associated with current and planned site use, respectively.

3.1.1 Current Site Conditions

Soil

As was previously described, the site exists as a vacant, unimproved lot and there are no known commercial or industrial operations except crude oil recovery occurring at the site. The results of site assessment activities conducted at the site indicate that residual chlorinated solvent and crude oil range petroleum hydrocarbons are present in subsurface soil. Given the depth of contamination and current site use, plausible complete exposure pathways currently exist for direct contact with hydrocarbon-affected soil (i.e., dermal contact and ingestion) and fugitive dust transport and vapor inhalation.

Groundwater

Groundwater at the site is currently monitored at 60 fbg. The water zone is reported to contain some high concentrations of dissolved solids and moderate concentrations of chloride and nitrate and is regionally contaminated with chlorinated solvents. No industrial, agricultural, or municipal wells utilizing groundwater from the perched groundwater-bearing zone were identified within a 1/2 mile radius of the site. Based on the absence of such wells and the reported poor water quality described for the near surface groundwater-bearing zone, current beneficial use of groundwater in the vicinity of the site is unlikely. In order to quantitatively evaluate the potential impact of residual petroleum hydrocarbons and chlorinated solvents on the shallow groundwater-bearing zone, a quantitative environmental fate and transport analysis was performed (Section 9.0 through 11.0 in the preceding section). The results of the environmental fate analysis indicate the potential impact of residual chlorinated solvent and crude oil concentrations on groundwater is insignificant.

3.1.2 Planned Developed Site Conditions

Adjacent land use in the vicinity of the site is generally consistent with a commercial or light industrial zoning designation. Although the site is currently undeveloped, it is being planned for pending site development associated with commercial or light industrial operations. Therefore, a qualitative evaluation of potential human exposures was performed for construction-related activities and for planned site use and occupancy expected to occur in the near-future (i.e., post construction).

Construction-Related Activities

For the purpose of performing a qualitative risk assessment, it was assumed that a one- to two-story commercial structure would be built on the subject site. It is reasonable to assume that construction of a the building may involve the installation of utilities (e.g., sewer connections, water supply, and electrical connections), minor site grading, and minor excavation for pouring a concrete slab or installing foundation footings. Generally, water supply and sewer connections require trenching and below grade installation at depths of less than five feet below grade. Concentrations of petroleum hydrocarbons and chlorinated solvents have been detected in soil samples obtained within five feet of the ground surface. Detectable concentrations of petroleum hydrocarbons in near-surface soils allows dermal contact, fugitive dust transport, and vapor inhalation as complete exposure pathways.

Planned Site Use

Following completion of site development activities, the site would exist as an improved lot with a one- to two-story structure and, presumably, a parking area. Under this assumption, the majority of the ground surface at the site would be capped with either concrete or asphalt. The presence of a concrete or asphalt cap would eliminate the potential for direct contact with subsurface soils. Given the anticipated site use, plausible exposure pathways associated with direct contact with chlorinated solvent or hydrocarbon-affected soil (i.e., dermal contact, ingestion and fugitive dust) would be eliminated. The presence of crude oil-range petroleum hydrocarbons in subsurface soil at the site is associated with one potential complete future exposure pathway (i.e., inhalation of vapors). However, because of the low volatility of crude oil-range petroleum hydrocarbons and the low concentrations of aromatic hydrocarbons detected in subsurface soil, the magnitude of potential human exposures via the vapor pathway is insignificant even under conservative exposure conditions. Chlorinated solvent concentrations in near surface soils are generally below values that indicate potential risk to human health through the inhalation pathway, however, to eliminate inhalation as a potential pathway mitigation or quantitative risk assessment may be warranted.

3.2 EXPOSURE EVALUATION ASSUMPTIONS

Potential human exposure pathways were evaluated to reflect the actual site conditions and planned land use without being unrealistically conservative. The uncertainties associated with assumptions regarding specific property development activities and planned land use are not considered to have a substantive effect on the qualitative exposure assessment unless such activities or land use is dramatically different from that assumed for this analysis.

3.3 SUMMARY OF QUALITATIVE EVALUATION OF HUMAN EXPOSURE PATHWAYS

A qualitative evaluation of potential human exposure pathways was performed for the subject site. The qualitative evaluation was based on the following information:

- Site-specific data regarding the distribution of chlorinated solvents and crude oil components;
- Observations of current site conditions, adjacent land use, and local zoning;
- Reasonably anticipated future land use and development considerations;
- Chemical and physical properties of the chemicals;
- Water quality data and local groundwater use;
- Quantitative environmental fate and transport modeling; and
- Site-specific data regarding local hydrogeology.

Based on the information provided above, the results of the qualitative human exposure pathway evaluation are as follow:

- The existing shallow (<5 fbg) subsurface crude oil and chlorinated solvent-affected soil at the site present four potentially complete exposure pathways under the existing site conditions and during planned site development construction activities (dermal contact, ingestion, fugitive dust and inhalation).
- Planned site development scenarios as outlined above would eliminate three of the four currently complete exposure pathways (dermal contact, ingestion, and fugitive dust).
- Mitigation of near surface crude-oil and solvent affected soil is necessary to eliminate all potential complete exposure pathways.

4.0 PROPOSED ACTIVITIES

The objective of the proposed activities is to reduce the residual near surface crude-oil and chlorinated solvent concentrations to levels that eliminate potential exposure pathways. The proposed remediation and site closure plan includes the following: 1) obtain permits for remediation activities; 2) excavate near surface (5 fbg or less) crude oil and chlorinated solvent affected soil demonstrating significant contaminant concentrations (as outlined below); 3) issue remedial action report; and 4) request regulatory closure.

4.1 REMEDIATION PERMITTING

Prior to starting remediation activities, necessary permits will be obtained.

4.2 PROPOSED REMEDIAL EXCAVATION

Excavation of chlorinated solvent and hydrocarbon-affected soil to a minimum depth of 5 fbg will be performed as outlined in Figure 15. If warranted based on field observations, excavation in the vicinity of Borings GP-44, GP-25, GP-36, GP-37, GP-38, HS-1 and HS-2 may extend to depth of approximately 10 to 15 fbg to remove additional TRPH-affected soil at concentrations above 1,000 ppm.

- Excavation limits have been set based on 1,000 ppm TRPH concentrations. Significant PAH concentrations (i.e. >32 ppb) were not detected at TRPH concentrations below 1,000 ppm (Table 2). Removal of 1,000 ppm and greater TRPH-affected soil to 5 fbg are expected to effectively eliminate exposure pathways identified in the previous section. Figure 15 depicts the planned minimum excavation extent and proposes removal of detected TRPH down to a concentration of 230 ppm to be conservative.

- Near surface (<10 fbg) PCE and TCE concentrations greater than 50 ppb have only been detected in four borings at the site. The proposed remedial excavations will remove these solvents from the site and are expected to effectively eliminate exposure pathways identified in the previous section.

4.3 VERIFICATION SAMPLING

Verification samples will be taken along the sidewalls of the excavation to confirm removal of near surface TRPH- and solvent-affected soil. Since near-surface solvents are only present along the property line with Continental Heat Treating (the likely source of the solvent contamination), confirmation samples for solvent removal will only be conducted in this area. TRPH confirmation samples will be collected from all excavations. Select samples will be submitted to a state-certified laboratory and analyzed for:

- TRPH using EPA method 418.1; and
- Chlorinated solvents using EPA method 8260.

4.4 SOIL DISPOSAL

Hydrocarbon-affected soil will be manifested and transported to an approved disposal/recycling facility.

4.5 REPORTING

After completion of the remedial action, a Remedial Action Report shall be submitted to summarize the objective of the remedial action, background information, site geology and hydrogeology, remedial action field activities, verification sampling findings, and conclusions.

5.0 WORK SCHEDULE

Planned activities will be performed according to the following estimated completion schedule:

- Expected agency approval of remedial action plan by October 24, 1997.
- Mobil Oil to commence excavation activities by November 1997.
- Submit a report summarizing remedial action activities by December 30, 1997.

6.0 SITE SAFETY PLAN

A site safety plan designed to promote project personnel safety and preparedness during the activities described in this work plan will be prepared prior to field activities.

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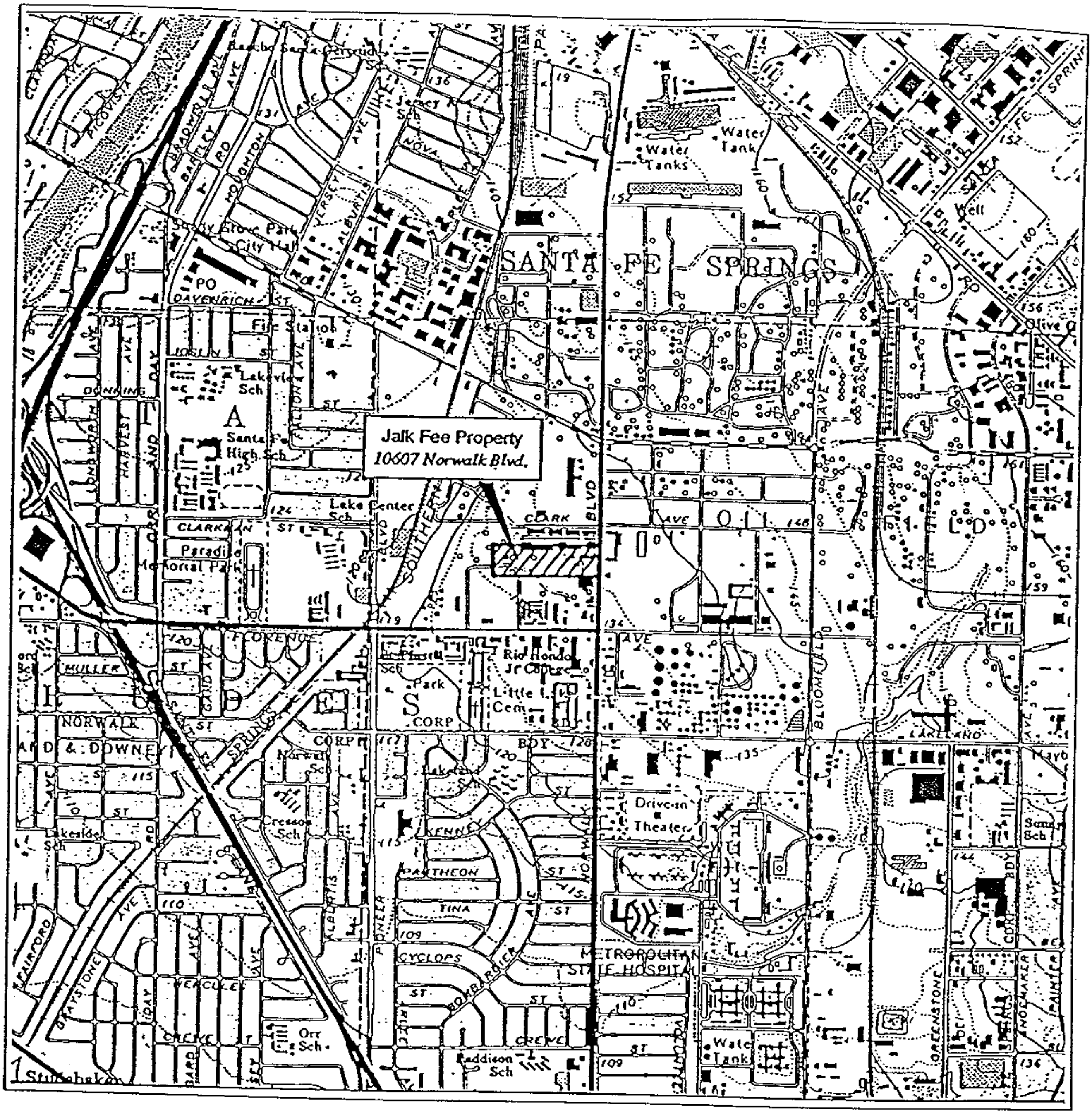

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SOURCE:
United States Geological Survey
7.5 Minute Topographic Map:
Whittier Quadrangle

VICINITY MAP

Mobil Jalk Fee Property
10607 Norwalk Boulevard
Santa Fe Springs, California

FIGURE 1

ALTON GEOSCIENCE
Irvine, California

23-0134 3/11/97

Table 1

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
June 18, 1997 through July 13, 1997
Mobil Jalk Fee Properties

Baring Number	Sample Date	Depth (fbg)	TRPH (ppm)	sec-Butyl benzene (ppb)	tert-Butyl benzene (ppb)	Iso propyl benzene (ppb)	p-Iso propyl toluene (ppb)	Naphth alene (ppb)	n-Propyl benzene (ppb)	1,2,4-Trimethyl benzene (ppb)	1,3,5-Trimethyl benzene (ppb)	o-Xylenes (ppb)	m,p-Xylenes (ppb)	cis-1,2-Dichloro ethene (ppb)	trans-1,2-Dichloro ethene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	Benzene (ppb)	Methylene Chloride (ppb)	Vinyl Chloride (ppb)	PCE (ppb)	TCE (ppb)
GP-25	6/18/97	5	7400	820	ND	570	950	4400	1100	10000	ND	ND	420	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	9100	73	ND	53	81	190	49	1000	ND	ND	61	ND	ND	ND	ND	ND	ND	ND	ND	ND
		15	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		20	29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		25	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21	3.6	ND	ND	ND	ND	ND	5.7	3.8
		30	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		35	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-26	6/18/97	5	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND
		15	35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.1	ND	ND	ND	ND	ND	ND	ND	ND
		20	37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.0	ND	ND	ND	ND	ND	ND	ND	ND
		25	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190	5.2	ND	ND	ND	ND	ND	17	25
		30	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND
		35	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	130	4.3	ND	ND	ND	ND	ND	54	35
GP-27	6/18/97	5	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.3	ND	ND	ND	ND	ND	ND	ND	ND
		15	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.9	ND	ND	ND	ND	ND	ND	ND	ND
		20	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13	ND	ND	ND	ND	ND	ND	ND	ND
		25	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	24	ND	ND	ND	ND	ND	ND	ND	ND
		30	24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	38	ND	ND	ND	ND	ND	ND	ND	2.1
		35	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	98	2.8	ND	ND	ND	ND	ND	43	28
GP-28	6/19/97	5	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		15	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		20	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.5	ND	ND	ND	ND	ND	ND	ND	ND
		25	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	91	ND	ND	ND	ND	ND	ND	2.9	3.6
		30	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	ND	ND	ND	ND	ND	ND	ND	ND

Table 1

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
June 18, 1997 through July 13, 1997
Mobil Jalk Fee Properties

Boring Number	Sample Date	Depth (fbg)	TRPH (ppm)	sec-Butyl benzene (ppb)	tert-Butyl benzene (ppb)	Iso propyl benzene (ppb)	p-Iso propyl toluene (ppb)	Naphth alene (ppb)	n-Propyl benzene (ppb)	1,2,4-Trimethyl benzene (ppb)	1,3,5-Trimethyl benzene (ppb)	o-Xylenes (ppb)	m,p-Xylenes (ppb)	cis-1,2-Dichloro ethene (ppb)	trans-1,2-Diebloro ethene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	Benzene (ppb)	Methylene Chloride (ppb)	Vinyl Chloride (ppb)	PCE (ppb)	TCE (ppb)
GP-29	6/19/97	5	26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		15	26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		20	24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.2	ND
		25	9.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.7	ND
		30	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.6	ND
GP-30	6/19/97	5	26	ND	ND	ND	ND	ND	ND	8.5	2.4	ND	2.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.4	ND
		15	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND
		20	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.8	ND
		25	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.9	ND	ND	ND	ND	ND	ND	43	ND
		30	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.6	ND
		35	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32	ND	ND	ND	ND	ND	ND	57	ND
GP-31	6/19/97	5	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5	ND
GP-31	6/19/97	10	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
(continued)		15	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	27	ND
		20	22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5	ND	ND	ND	ND	ND	ND
		25	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19	ND
		30	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	24	ND
		35	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1400	ND
GP-32	6/19/97	5	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.9	ND
		15	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	ND
		20	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6	ND
		25	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	59	ND

Table 1

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
June 18, 1997 through July 13, 1997
Mobil Jalk Fee Properties

Boring Number	Sample Date	Depth (fbg)	TRPH (ppm)	sec-Butyl benzene (ppb)	tert-Butyl benzene (ppb)	Iso prnpyl benzene (ppb)	p-Iso propyl toluene (ppb)	Naphth alene (ppb)	n-Propyl benzene (ppb)	1,2,4-Trimethyl benzene (ppb)	1,3,5-Trimethyl benzene (ppb)	o-Xylenes (ppb)	m,p-Xylenes (ppb)	cis-1,2-Dichloro ethene (ppb)	trans-1,2-Dichloro ethene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	Benzene (ppb)	Methylene Chloride (ppb)	Vinyl Chloride (ppb)	PCE (ppb)	TCE (ppb)
		30	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3	ND
		35	11	ND	ND	ND	ND	ND	ND	3.0	ND	ND	ND	5.5	ND	ND	ND	ND	ND	ND	180	3.7
GP-33	6/19/97	5	24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.5	ND
		10	12	ND	ND	ND	ND	ND	ND	4.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6	ND
		15	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	23	ND
		19.5	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.9	ND
		25	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	ND
		30	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22	ND
		35	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6	ND	ND	ND	2.2	ND	ND	170	5.0
GP-34	6/20/97	5	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		15	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		20	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	27	ND	ND	ND	ND	ND	ND	ND	ND
		25	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		30	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	68	ND	ND	ND	ND	ND	ND	ND	ND
		35	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	110	ND	ND	ND	ND	ND	ND	10	ND
GP-35	6/20/97	5	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.6	ND	ND	ND	ND	ND	ND	ND	ND
		10	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19	ND	ND	ND	ND	ND	ND	ND	ND
		15	300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	990	ND
		20	22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	200	ND	ND	ND	ND	ND	ND	21	6.1
		25	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.7	ND	ND	ND	ND	ND	ND	ND	ND
		30	28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	51	ND	ND	ND	ND	ND	ND	ND	ND
		35	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190	ND	ND	ND	ND	ND	ND	6.7	5.8
GP-36	6/20/97	5	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	8400	240	32	12	ND	ND	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND	ND	ND

Table 1

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
June 18, 1997 through July 13, 1997
Mobil Jalk Fee Properties

Boring Number	Sample Date	Depth (fbg)	TRPH (ppm)	sec-Butyl benzene (ppb)	tert-Butyl benzene (ppb)	Iso propyl benzene (ppb)	p-Iso propyl toluene (ppb)	Naphth alene (ppb)	n-Propyl benzene (ppb)	1,2,4-Trimethyl benzene (ppb)	1,3,5-Trimethyl benzene (ppb)	o-Xylenes (ppb)	m,p-Xylenes (ppb)	cis-1,2-Dichloro ethene (ppb)	trans-1,2-Dichloro ethene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	Benzene (ppb)	Methylene Chloride (ppb)	Vinyl Chloride (ppb)	PCE (ppb)	TCE (ppb)
		15	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		19.5	24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		25	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21	ND	ND	ND	ND	ND	ND	ND	ND
		30	27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.3	ND	ND	ND	ND	ND	ND	ND	ND
		35	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND	ND	ND
GP-37	6/20/97	5	2300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	700	ND
		10	1500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		16.5	990	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.4	ND	ND	6.7	ND	29	ND	ND
		20	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	43	ND	ND	ND	ND	ND	ND	ND	ND
		25	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	230	ND	ND	ND	ND	ND	ND	ND	ND
		30	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190	ND	ND	ND	ND	ND	ND	ND	ND
GP-38	6/23/97	5	6700	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1000	ND
		10	3600	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	44	8.9	ND	ND	ND	29	ND	ND	6.6
		17	350	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	35	ND	5.1	3.2
		20	28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.0	ND	ND	ND	ND	23	ND	ND	ND
		25	9.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32	ND	ND	ND	ND	24	ND	17	5.5
		30	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19	ND	ND	ND	ND	ND	ND	2.2	ND
GP-39	6/23/97	5	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25	ND	3.5	ND
		10	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND
		15	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	47	ND
		20	9.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13	ND
		25	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	26	ND	70	ND
		30	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	34	ND	ND	ND
		35	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	800	ND
GP-40	6/23/97	5	280	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	42000	ND
GP-40	6/23/97	10	29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	440	ND

Table 1

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
June 18, 1997 through July 13, 1997
Mobil Jalk Fee Properties

Boring Number	Sample Date	Depth (fbg)	TRPH (ppm)	sec-Butyl benzene (ppb)	tert-Butyl benzene (ppb)	Iso propyl benzene (ppb)	p-Iso propyl toluene (ppb)	Naphth alene (ppb)	n-Propyl benzene (ppb)	1,2,4-Trimethyl benzene (ppb)	1,3,5-Trimethyl benzene (ppb)	o-Xylenes (ppb)	m,p-Xylenes (ppb)	cis-1,2-Dichloro ethene (ppb)	trans-1,2-Dichloro ethene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	Benzene (ppb)	Methylene Chloride (ppb)	Vinyl Chloride (ppb)	PCE (ppb)	TCE (ppb)
(continued)		15	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	160	ND
		20	34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32	ND	10	ND
		25	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	57	ND
		30	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	69	ND
		35	29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND	ND	48	ND
GP-41	6/23/97	5	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		15	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.9	ND
		20	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13	ND	ND	ND
		25	28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6	ND	ND	ND	ND	ND	ND	80	ND
		30	24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32	ND	2.6	ND
GP-42	6/23/97	5	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21	ND	ND	ND
		10	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		15	920	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		20	8.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		25	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.0	ND	ND	ND	ND	ND	ND	ND	ND
		30	36	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-43	6/24/97	5	24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-43	6/24/97	15	26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
(continued)		20	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		25	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.2	ND	ND	ND	ND	ND	ND	2.2	ND
		30	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-44	6/24/97	5	1300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	220	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 1

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
June 18, 1997 through July 13, 1997
Mobil Jalk Fee Properties

Boring Number	Sample Date	Depth (fbg)	TRPH (ppm)	sec-Butyl benzene (ppb)	tert-Butyl benzene (ppb)	Iso propyl benzene (ppb)	p-Iso propyl toluene (ppb)	Naphth alene (ppb)	n-Propyl benzene (ppb)	1,2,4-Trimethyl benzene (ppb)	1,3,5-Trimethyl benzene (ppb)	o-Xylenes (ppb)	m,p-Xylenes (ppb)	cis-1,2-Dichloro ethene (ppb)	trans-1,2-Dichloro ethene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	Benzene (ppb)	Methylene Chloride (ppb)	Vinyl Chloride (ppb)	PCE (ppb)	TCE (ppb)
		15	2300	ND	ND	ND	ND	190	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		20	42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		25	67	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.3	2.0	ND	ND	ND	ND	ND	3.5	2.4
		30	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-45	6/24/97	5	390	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	68	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		15	43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		20	41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		25	42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		30	39	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-46	6/24/97	5	1100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		15	36	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		20	32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-46	6/24/97	25	40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.7	ND	ND	ND	ND	ND	ND	ND	ND
(continued)		30	34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND	ND	ND	ND
HS-1	7/13/97	6.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	48	ND
		11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	89	ND
		21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19	ND
		26	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	580	ND
		31	8.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	170	3.7
		41.5	7.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.8	ND
		46	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	ND
		51	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.2	ND
HS-1	7/13/97	61	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND

Table 1

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
June 18, 1997 through July 13, 1997
Mobil Jalk Fee Properties

Boring Number	Sample Date	Depth (fbg)	TRPH (ppm)	sec-Butyl benzene (ppb)	tert-Butyl benzene (ppb)	Iso propyl benzene (ppb)	p-Iso propyl toluene (ppb)	Naphth alene (ppb)	n-Propyl benzene (ppb)	1,2,4-Trimethyl benzene (ppb)	1,3,5-Trimethyl benzene (ppb)	o-Xylenes (ppb)	m,p-Xylenes (ppb)	cis-1,2-Dichloro ethene (ppb)	trans-1,2-Dichloro ethene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	Benzene (ppb)	Methylene Chloride (ppb)	Vinyl Chloride (ppb)	PCE (ppb)	TCE (ppb)
HS-2	7/12/97	6.5	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	2.2
		11	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	150	ND	ND	ND	ND	ND	ND	ND	15
		16	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.4	9.3	ND	2.7	ND	ND	ND	ND	3.9	ND
		21	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	56	ND	ND	ND	ND	ND	ND	3.7	3.8
		26	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	580	ND	ND	ND	ND	ND	ND	55	47
		31	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	910	ND	ND	ND	ND	ND	ND	76	64
		36.5	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	160	ND	ND	ND	ND	ND	ND	25	14
		41.5	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	2.6	ND
		46	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.8	ND	ND	ND	ND	ND	ND	3.1	ND
		51.5	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.8	ND	ND	ND	ND	ND	ND	ND	ND
HS-2	7/12/97	56	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.2	ND	ND	ND	ND	ND	ND	ND	ND
(continued)		61	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND	ND	ND
HS-3	7/12/97	6	1100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	830	ND	ND	ND	ND	ND	ND	ND	ND
		11	2300	68	ND	27	ND	ND	22	ND	ND	ND	ND	57	ND	ND	ND	20	ND	ND	ND	ND
		16	--	2800	ND	1500	ND	7900	2400	ND	ND	ND	ND	17000	ND	ND	ND	980	ND	ND	ND	ND
		21	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	93	ND	ND	ND	ND	ND	ND	ND	ND
		26	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1000	ND	ND	ND	ND	ND	ND	ND	ND
		31	22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2000	ND	ND	ND	ND	ND	ND	ND	ND
		36	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	420	ND	ND	ND	4.4	ND	ND	18	6.5
		41	5.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270	ND	ND	ND	ND	ND	ND	7.4	4.1
		46	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	ND
		51	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	24	ND	ND	ND	ND	ND	ND	7.0	ND
		56	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	41	ND	ND	ND	ND	ND	ND	12	2.8
		61	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	130	ND	ND	ND	ND	ND	ND	25	7.5
HS-4	7/12/97	6	960	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		11	2100	27	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.4	5.3	ND	ND	ND	ND	9.1	ND	ND
		16	--	7.5	ND	2.7	ND	13	4.3	ND	ND	ND	ND	15	3.3	ND	ND	ND	ND	ND	ND	ND

Table 1

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
June 18, 1997 through July 13, 1997
Mobil Jalk Fee Properties

Boring Number	Sample Date	Depth (fbg)	TRPH (ppm)	sec-Butyl benzene (ppb)	tert-Butyl benzene (ppb)	Iso propyl benzene (ppb)	p-Iso propyl toluene (ppb)	Naphth alene (ppb)	n-Propyl benzene (ppb)	1,2,4-Trimethyl benzene (ppb)	1,3,5-Trimethyl benzene (ppb)	o-Xylenes (ppb)	m,p-Xylenes (ppb)	cis-1,2-Dichloro ethene (ppb)	trans-1,2-Dichloro ethene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	Benzene (ppb)	Methylene Chloride (ppb)	Vinyl Chloride (ppb)	PCE (ppb)	TCE (ppb)
		21	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	66	6.1	ND	ND	ND	ND	8.6	2.3	2.2
		26	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	200	13	ND	ND	ND	ND	16	8.7	7.5
		31	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	160	8	ND	ND	ND	ND	9.4	11	6.9
		36	8.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	48	2.3	ND	ND	ND	ND	ND	8.5	2.9
HS-4	7/12/97	41	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	5.3	ND	ND	ND	ND	ND	46	13
(continued)		46	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21	ND	ND	ND	ND	ND	ND	7.1	ND
		51	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	22	6.6
		56	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND	ND	4	ND
		61	8.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND	ND
HS-5	7/13/97	6.5	940	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		11	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		16	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		21	6.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-6	7/13/97	6.5	230	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		11	5.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		16	5.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-7	7/13/97	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		11	7.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		16	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		21.5	8.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-8	7/13/97	6	5.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		11	140	ND	ND	ND	ND	ND	ND	ND	ND	6.8	17	ND	ND	ND	3.8	ND	ND	ND	3.5	ND
		16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-9	7/13/97	6	990	ND	ND	ND	ND	ND	ND	ND	ND	12	28	ND	ND	3	6.1	ND	ND	ND	ND	ND
		11	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 1

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
June 18, 1997 through July 13, 1997
Mobil Jalk Fee Properties

Baring Number	Sample Date	Depth (fbg)	TRPH (ppm)	sec-Butyl benzene (ppb)	tert-Butyl benzene (ppb)	Iso propyl benzene (ppb)	p-Isa prapyl toluene (ppb)	Naphth alene (ppb)	n-Propyl benzene (ppb)	1,2,4-Trimethyl benzene (ppb)	1,3,5-Trimethyl benzene (ppb)	o-Xylenes (ppb)	m,p-Xylenes (ppb)	cis-1,2-Dichlaro ethene (ppb)	trans-1,2-Dichlora ethene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	Benzene (ppb)	Methylene Chlaride (ppb)	Vinyl Chlaride (ppb)	PCE (ppb)	TCE (ppb)
		16	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
- TRPH = total petroleum hydrocarbons with gasoline distinction
- PCE = tetrachloroethene
- TCE = trichloroethene
- fbg = feet below grade
- ppm = parts per million
- ppb = parts per billion
- ND = not detected; see official laboratory reports for detection limits
- -- = not analyzed, measured, or collected

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* User name:   SUPERVISOR (32)            Queue:   IR1/GOLLUM                   *
* File name:                              Server:  PS_GOLLUM                    *
* Directory:                                                                    *
* Description: HYDROC.XLS                                                       *
*              February 20, 1998                   9:04am                       *
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*                                                                              *
*          SSS  U   U PPPP  EEEEE RRRR  V   V  III   SSS   OOO  RRRR           *
*         S   S U   U P   P E     R   R V   V   I   S   S O   O R   R          *
*         S     U   U P   P E     R   R V   V   I   S     O   O R   R          *
*          SSS  U   U PPPP  EEEE  RRRR  V   V   I    SSS  O   O RRRR           *
*             S U   U P     E     R R   V   V   I       S O   O R R            *
*         S   S U   U P     E     R  R   V V    I   S   S O   O R  R           *
*          SSS   UUU  P     EEEEE R   R   V    III   SSS   OOO  R   R          *
*                                                                              *
*                                                                              *
*                                                                              *
********************************************************************************
*                                                                              *
*                           L      SSS  TTTTT                                  *
*                           L     S   S   T                                    *
*                           L     S       T     ::                             *
*                           L      SSS    T     ::                             *
*                           L         S   T                                    *
*                           L     S   S   T     ::                             *
*                           LLLLL  SSS    T     ::                             *
*                                                                              *
*                                                                              *
*                                                                              *
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Table 2

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
June 18 to 20, 1997
Mobil Jalk Fee Properties

Sample Number	Sample Date	Depth (fbg)	8015 Extractable fuel HC (ppm)	418.1 TRPH (ppm)	Acena phtene (ppb)	Benz (a) anthracene (ppb)	Benzo (a) pyrene (ppb)	Benzo (b) fluoranthene (ppb)	Benzo (g,h,i,) perylene (ppb)	Benzo (k) fluoranthene (ppb)	Chrysene (ppb)	Dibenz (a,h) anthracene (ppb)	Fluor anthene (ppb)	Ideno (1,2,3-cd) pyrene (ppb)	Naph thalene (ppb)	Phen anthrene (ppb)	Pyrene (ppb)
GP-25	6/18/97	5	3600*	7400	--	3000	110	350	370	ND	14000	4000	3500	ND	2400	18000	3700
		10	1300*	9100	470	720	38	110	ND	61	770	1000	1000	ND	200	4200	1300
		15	ND	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		20	ND	29	32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.0	ND
		25	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-26	6/18/97	35	ND	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-32	6/19/97	5	ND	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	130	ND	ND
GP-34	6/20/97	5	ND	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-37	6/18/97	5	290**	2300	1100	69	91	42	83	36	64	59	160	67	ND	110	130
		10	300**	1500	6500	2300	2500	1300	1700	1100	4200	2100	7100	1700	ND	5000	4900
HS-3	7/12/97	6	430*	1100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		11	1100*	2300	ND	270	ND	ND	ND	ND	ND	ND	1100	ND	ND	640	ND
		26	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		46	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21	ND	ND
		51	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-5	7/13/97	6.5	200*	940	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-5	7/13/97	16	ND	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-6	7/13/97	6.5	77*	230	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-8	7/13/97	11	ND	5.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 2

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
June 18 to 20, 1997
Mobil Jalk Fee Properties

Sample Number	Sample Date	Depth (fbg)	8015 Extractable fuel HC (ppm)	418.1 TRPH (ppm)	Acena phtene (ppb)	Benz (a) anthracene (ppb)	Benzo (a) pyrene (ppb)	Benzo (b) fluoranthene (ppb)	Benzo (g,h,i,) perylene (ppb)	Benzo (k) fluoranthene (ppb)	Chrysene (ppb)	Dibenz (a,h) anthracene (ppb)	Fluor anthene (ppb)	Ideno (1,2,3-cd) pyrene (ppb)	Naph thalene (ppb)	Phen anthrene (ppb)	Pyrene (ppb)

Notes:			
	TRPH	=	total petroleum hydrocarbons with gasoline distinction
	fbg	=	feet below grade
	ppm	=	parts per million
	ppb	=	parts per billion
	ND	=	not detected; see official laboratory report for detection limits
	--	=	not analyzed, measured, or collected
	*	=	Hydrocarbons detected by EPA Method 8015 range from C8 to C40.
	**	=	Hydrocarbons detected by EPA Method 8015 range from C14 to C40.

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* User name:   SUPERVISOR (32)                 Queue:  IR1/GOLLUM               *
* File name:                                   Server: PS_GOLLUM                *
* Directory:                                                                    *
* Description: SOILMTL.XLS                                                      *
*              February 20, 1998                       9:04am                   *
********************************************************************************
*                                                                               *
*          SSS  U   U PPPP  EEEEE RRRR  V   V  III   SSS   OOO  RRRR            *
*         S   S U   U P   P E     R   R V   V   I   S   S O   O R   R           *
*         S     U   U P   P E     R   R V   V   I   S     O   O R   R           *
*          SSS  U   U PPPP  EEEE  RRRR  V   V   I    SSS  O   O RRRR            *
*             S U   U P     E     R R   V   V   I       S O   O R R             *
*         S   S U   U P     E     R  R   V V    I   S   S O   O R  R            *
*          SSS   UUU  P     EEEEE R   R   V    III   SSS   OOO  R   R           *
*                                                                               *
*                                                                               *
*                                                                               *
********************************************************************************
*                                                                               *
*                            L      SSS  TTTTT                                  *
*                            L     S   S   T                                    *
*                            L     S       T     ::                             *
*                            L      SSS    T     ::                             *
*                            L         S   T                                    *
*                            L     S   S   T     ::                             *
*                            LLLLL  SSS    T     ::                             *
*                                                                               *
*                                                                               *
*                                                                               *
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Table 3

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
CAM Metals
July 12 and 13, 1997
Mobil Jalk Fee Properties

ANALYTE	Well Number									STLC	TTLC
	HS-3-6 (ppm)	HS-3-11 (ppm)	HS-3-26 (ppm)	HS-3-46 (ppm)	HS-3-51 (ppm)	HS-5-6.5 (ppm)	HS-5-16 (ppm)	HS-6-6.5 (ppm)	HS-8-11 (ppm)	Max. Limit (ppm)	Max. Limit (ppm)
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	15	500
Arsenic	ND	4.1	14	2.1	ND	3.2	ND	2.4	4.5	5.0	500
Barium	100	100	680	45	85	130	120	110	130	100	10000
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.75	75
Cadmium	ND	ND	0.59	ND	0.55	1.1	0.75	0.69	0.64	1.0	100
Chromium, VI	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.0	500
Chromium, total	19	23	28	9.8	16	34	22	22	22	5.0	2500
Cobalt	10	12	19	4.6	10	13	11	12	12	80	8000
Copper	17	24	38	9.1	17	33	22	18	20	25	2500
Lead	6.1	7.6	9.4	ND	2.7	43	5	4.4	4.9	5.0	1000
Mercury	0.038	0.039	0.064	0.041	0.066	0.044	0.067	0.049	0.040	0.20	20
Molybdenum	ND	ND	ND	ND	ND	3.1	ND	ND	ND	350	3500
Nickel	21	26	35	9.1	16	27	23	20	21	20	2000
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	100
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.0	500
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.0	700
Vanadium	37	43	63	15	35	37	30	39	36	24	2400
Zinc	60	48	75	20	44	86	55	46	45	250	5000

Notes:
STLC = Soluble Threshold Limit Concentration
TTLC = Total Threshold Limit Concentration
ppm = parts per million
ND = not detected above laboratory detection limits, refer to official laboratory reports

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* User name:   SUPERVISOR (32)                Queue:  IR1/GOLLUM              *
* File name:                                  Server: PS_GOLLUM               *
* Directory:                                                                  *
* Description: PESTPCB.XLS                                                    *
*              February 20, 1998                      9:05am                  *
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*                                                                             *
*          SSS  U   U PPPP  EEEEE RRRR  V   V  III   SSS   OOO  RRRR          *
*         S   S U   U P   P E     R   R V   V   I   S   S O   O R   R         *
*         S     U   U P   P E     R   R V   V   I   S     O   O R   R         *
*          SSS  U   U PPPP  EEEE  RRRR  V   V   I    SSS  O   O RRRR          *
*             S U   U P     E     R R   V   V   I       S O   O R R           *
*         S   S U   U P     E     R  R   V V    I   S   S O   O R  R          *
*          SSS   UUU  P     EEEEE R   R   V    III   SSS   OOO  R   R         *
*                                                                             *
*                                                                             *
*                                                                             *
*******************************************************************************
*                                                                             *
*                            L      SSS  TTTTT                                *
*                            L     S   S   T                                  *
*                            L     S       T    ::                            *
*                            L      SSS    T    ::                            *
*                            L         S   T                                  *
*                            L     S   S   T    ::                            *
*                            LLLLL  SSS    T    ::                            *
*                                                                             *
*                                                                             *
*                                                                             *
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Table 4

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
ORGANOCHLORINE PESTICIDES AND PCBs
July 12 and 13, 1997
Mobil Jalk Fee Properties

ANALYTE	SAMPLE NUMBER & DATE								
	HS-3-6' 7/12/97 (μg/kg)	HS-3-11' 7/12/97 (μg/kg)	HS-3-26' 7/12/97 (μg/kg)	HS-3-46' 7/12/97 (μg/kg)	HS-3-51' 7/12/97 (μg/kg)	HS-5-6.5' 7/13/97 (μg/kg)	HS-5-16' 7/13/97 (μg/kg)	HS-6-6.5' 35624 (μg/kg)	HS-8-11' 35624 (μg/kg)
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND
alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND
beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND
delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND
gamma-BHC (Lindane)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND	31	ND	ND	ND	ND
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endolsulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
ORGANOCHLORINE PESTICIDES AND PCBs
July 12 and 13, 1997
Mobil Jalk Fee Properties

ANALYTE	SAMPLE NUMBER & DATE								
	H3-6' 7/12/97 (μg/kg)	**H3-11'** 7/12/97 (μg/kg)	**H3-26'** 7/12/97 (μg/kg)	**H3-46'** 7/12/97 (μg/kg)	**H3-51'** 7/12/97 (μg/kg)	**H5-6.5'** 7/13/97 (μg/kg)	**H5-16'** 7/13/97 (μg/kg)	**H6-6.5'** 35624 (μg/kg)	**H8-11'** 35624 (μg/kg)
Polychlorinated Biphenyls									
PCBs	ND	ND	ND	ND	ND	ND	ND	ND	ND

All samples collected are measured in feet below grade.

Notes:
μg/kg = micrograms per kilogram
ND = not detected; see official laboratory report for detection limits
PCBs = polychlorinated biphenyls

Table 6

RESULTS OF LABORATORY ANALYSIS OF GROUNDWATER SAMPLES
GASOLINE-RANGE HYDROCARBONS
March 1994 through March 1997
Mobil Jalk Fee Property

Sample Number	Sample Date	Elevation TOC (feet)	Depth to Water (feet)	Groundwater Elevation (feet)	TPH-G (µg/l)	Benzene (µg/l)	Toulene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)
MMW-3	03/15/94	134.26	64.92	69.34	ND	4	13	26	101
	06/22/94	134.26	63.08	71.18	ND	ND	ND	ND	ND
	09/16/94	134.26	64.34	69.92	ND	ND	3	ND	6
	12/16/94	134.26	66.21	68.05	ND	ND	8	2	8
	03/08/95	134.26	64.95	69.31	ND	28	28	2	18
	* 03/26/97	99.17	62.25	36.92	ND	ND	ND	ND	ND
MMW-4	03/15/94	131.40	64.36	67.04	ND	ND	4	10	38
	06/22/94	131.40	62.73	68.67	ND	ND	ND	ND	ND
	09/16/94	131.40	64.32	67.08	ND	ND	ND	ND	ND
	12/16/94	131.40	66.10	65.30	ND	ND	7	3	9
	03/08/95	131.40	65.38	66.02	ND	2	2	ND	1
	* 03/26/97	96.34	61.57	34.77	ND	ND	ND	ND	ND
MMW-5	03/15/94	133.38	66.26	67.12	ND	ND	ND	11	37
	06/22/94	133.38	64.45	68.93	ND	ND	ND	ND	ND
	09/16/94	133.38	65.61	67.77	ND	ND	ND	ND	ND
	12/16/94	133.38	67.34	66.04	ND	ND	1	2	1
	03/08/95	133.38	66.16	67.22	ND	ND	ND	ND	ND
	* 03/26/97	98.33	63.45	34.88	400	ND	ND	ND	ND

Notes:
TOC = top of casing
TPH-G = total petroleum hydrocarbons with gasoline distinction
µg/l = micrograms per liter
ND = not detected; see official laboratory reports for detection limits
-- = not analyzed, measured, or collected
* = measured to an arbitrary benchmark of 100 feet

Table 7

RESULTS OF LABORATORY ANALYSIS OF GROUNDWATER SAMPLES
VOLATILE ORGANICS, METALS, AND WATER QUALITY
March 1994 through March 1997
Mobil Jalk Fee Property

		Volatile Organics				Metals†			Water Quality				
Sample Number	Sample Date	PCE (μg/l)	TCE (μg/l)	1-1, DCA (μg/l)	1,1- DCE (μg/l)	Mn (mg/l)	Mercury (mg/l)	Zn (mg/l)	Chloride (mg/l)	Fluoride (mg/l)	Nitrate (mg/l)	Sulfate (mg/l)	Dissolved Solids (mg/l)
MMW-3	3/15/94	5	25	2	10	--	ND	89	--	--	--	--	1200
	6/22/94	4	24	2	8	--	--	--	--	--	--	--	1300
	9/16/94	ND	12	ND	3	--	--	--	--	--	--	--	1700
	12/16/94	3	17	2	5	--	--	--	--	--	--	--	1300
	3/8/95	4	20	2	2	--	--	--	--	--	--	--	1100
	3/26/97	12	23	2.0	7.0	0.58	0.011	0.45	170	ND	25	230	1200
MMW-4	3/15/94	4	18	ND	2	--	0.4	56	--	--	--	--	1100
	6/22/94	2	16	ND	ND	--	--	--	--	--	--	--	1100
	9/16/94	ND	6	ND	ND	--	--	--	--	--	--	--	1700
	12/16/94	1	6	ND	ND	--	--	--	--	--	--	--	1200
	3/8/95	5	9	ND	ND	--	--	--	--	--	--	--	1300
	3/26/97	4.2	4.0	ND	ND	ND	0.0027	0.077	200	ND	21	200	1400
MMW-5	3/15/94	330	60	ND	5	--	ND	ND	--	--	--	--	1100
	6/22/94	930	100	ND	ND	--	--	--	--	--	--	--	1100
	9/16/94	830	82	ND	ND	--	--	--	--	--	--	--	1200
	12/16/94	1400	140	ND	5	--	--	--	--	--	--	--	1100
	3/8/95	2200	180	ND	ND	--	--	--	--	--	--	--	1200
	3/26/97	1100	88	ND	ND	0.70	ND	0.40	230	ND	1.9	230	1400

Table 7

RESULTS OF LABORATORY ANALYSIS OF GROUNDWATER SAMPLES VOLATILE ORGANICS, METALS, AND WATER QUALITY

March 1994 through March 1997

Mobil Jalk Fee Property

		Volatile Organics				Metals†			Water Quality				
Sample Number	Sample Date	PCE (μg/l)	TCE (μg/l)	1-1, DCA (μg/l)	1,1-DCE (μg/l)	Mn (mg/l)	Mercury (mg/l)	Zn (mg/l)	Chloride (mg/l)	Fluoride (mg/l)	Nitrate (mg/l)	Sulfate (mg/l)	Dissolved Solids (mg/l)

Notes:

PCE	=	tetrachloroethene
TCE	=	trichloroethene
1-1 DCA	=	1,1-Dichloroethane
1-1 DCE	=	1,1-Dichloroethene
Mn	=	manganese
Zn	=	zinc
μg/l	=	micrograms per liter
mg/l	=	milligrams per liter
ND	=	not detected; see official laboratory reports for detection limits
--	=	not analyzed, measured, or collected
†	=	only metal constituents detected above laboratory detection limits are shown

Table 8
SESOIL INPUT PARAMETERS FOR PCE, TCE, AND (cis) 1,2-DCE

Parameters	Units	Reference, Assumptions, and/or Comments	PCE	TCE	cis-1,2-DCE
CLIMATE AND SIMULATION TIME INPUT PARAMETERS					
			SSOUT003.out	SSOUT005.out	SSOUT009.out
Weather Station	[-]	From SESOIL climate database	Brea Dam	Brea Dam	Brea Dam
Number of years of climate data	[yr]	Default value	1	1	1
Air Temperature	[Deg C]	From SESOIL climate database, default value	Varies according to weather database	Varies according to weather database	Varies according to weather database
Number of years of simulation	[yr]	Professional judgment	150	150	150
PARAMETERS AVERAGED ACROSS ENTIRE SOIL COLUMN TO GROUNDWATER					
Bulk Density	[g/cm3]	Site specific average of 12 measurements from HS-1 through HS-4	1.49	1.49	1.49
Disconnectedness Index	[-]	From SESOIL soils database, assumed loamy sand soil column	3.9	3.9	3.9
Effective Porosity	[fraction]	From SESOIL soils database, corresponds with loamy sand	0.28	0.28	0.28
Total organic carbon content	(%)	Site specific average of 11 measurements from HS-1 through HS-4	0.093	0.093	0.093
Freundlich Isotherm exponent, FRN	[-]	Assumes sorption isotherm is linear; Lyman, et al., 1992	1	1	1
CONTAMINANT PROPERTIES					
Solubility	[mg/l]	From SESOIL chemical database	240.00	1100.00	3500.00
Diffusion Coefficient in Air	[cm2/sec]	From SESOIL chemical database	0.00739	0.083	0.079
Henry's Constant	[m3-atm/mol] @ 25°C	From SESOIL chemical database	0.017	0.0094	0.0037
Adsorption coeff. on organic carbon, Koc	[(ug/g-oc)/(ug/ml)]	From SESOIL chemical database	364	126	86
Molecular weight	[g/mol]	From SESOIL chemical database	165.83	131.50	96.94
Neutral hydrolysis (l/day), KNH	[1/day]	Parameter not included in model simulations	--	--	--
Base hydrolysis (l/mol/day), KBH	[l/mol/day]	Parameter not included in model simulations	--	--	--
Acid hydrolysis, KAH	[l/mol/day]	Parameter not included in model simulations	--	--	--
Liquid Phase Biodegradation Rate	[1/day]	Parameter not included in model simulations, assumed no contaminant decay	--	--	--
Solid Phase Biodegradation Rate	[1/day]	Parameter not included in model simulations, assumed no contaminant decay	--	--	--
Ligand stability const., SK	[-]	Parameter not included in model simulations	--	--	--
Moles ligand per model compound, B	[mol/mol]	Parameter not included in model simulations	--	--	--
Molecular weight of the ligand (g/mole), MWTLIG	[g/mol]	Parameter not included in model simulations	--	--	--
APPLICATION DATA					
Number of years	[yr]	Calculates instantaneous load for first year and zero load for the second.	2	2	2

Table 8
SESOIL INPUT PARAMETERS FOR PCE, TCE, AND (cis) 1,2-DCE

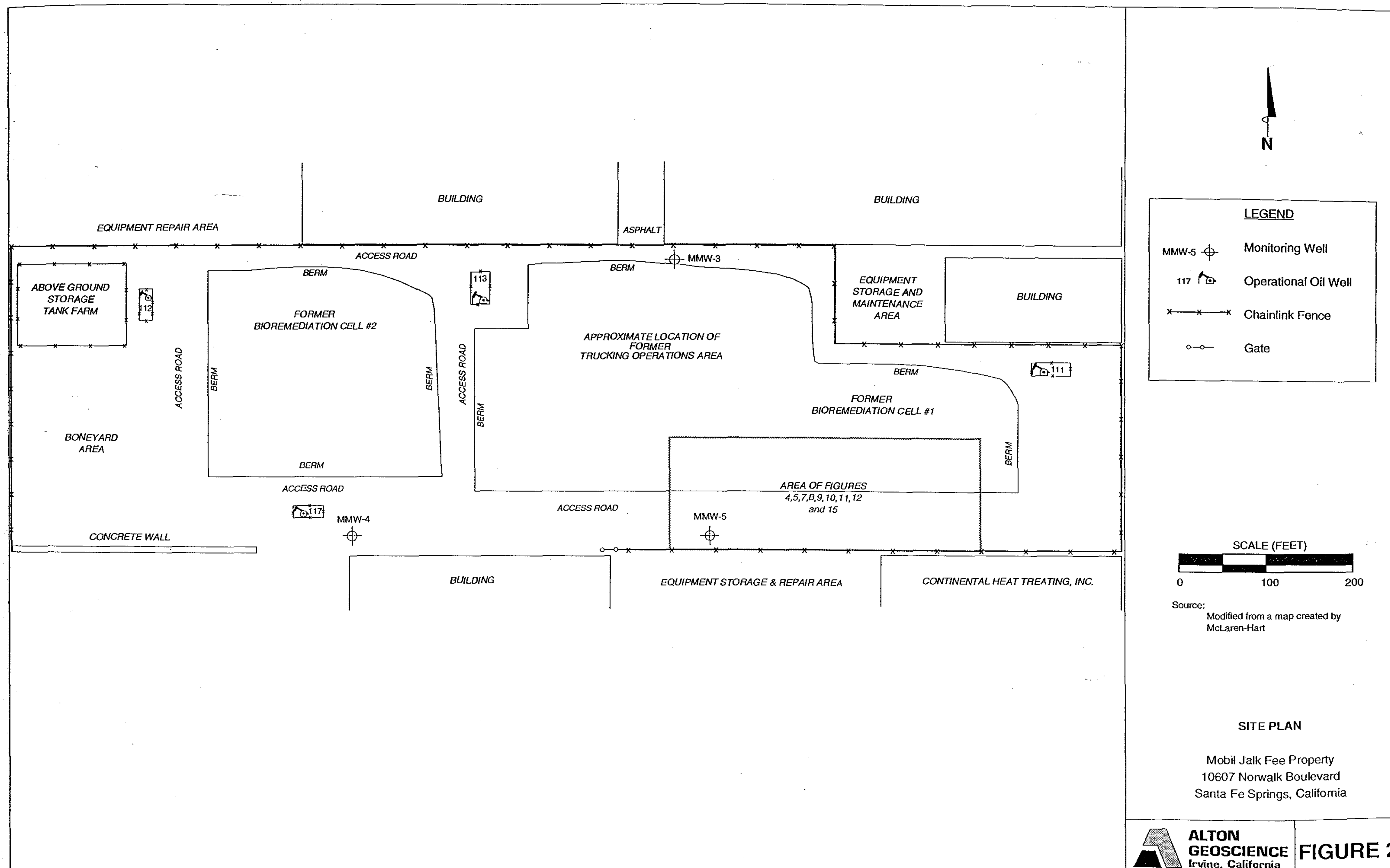
Parameters	Units	Reference, Assumptions, and/or Comments	PCE	TCE	cis-1,2-DCE
Number of soil layers	[-]	Layer 1, 23 feet of silty sand and sandy silt; Layer 2, 3 feet of clay; Layer 3, 13 feet of silt; and Layer 4, 21 feet of silty sand and sand.	4	4	4
Application Area	cm2	See figures of estimated lateral extent of impacted soil, used 10 ppb contour of each contaminant to estimate area of impacted soil	13,935,456	1,393,545	4,854,183
Loading Type	[ug/cm2/day]	For modeling purposes assumed contaminant currently in soil is the only potential source of contaminant to groundwater.	Instantaneous	Instantaneous	Instantaneous
		LAYER 1			
Description		Sandy silt to silty sand: impacted soil extends from 0 to 23 feet below grade (fbg)			
Thickness	cm	23 feet	701	701	701
Number of Sublayers		one	1	1	1
Initial contaminant concentration	[ug/g]	Average contaminant concentration of samples above 10 ug/Kg	0.212	0.015	1.165
Bulk Density	g/cm3	Site specific average of samples HS-1 through HS-4 @ 16 fbg	1.52	1.52	1.52
Loading	ug/cm2	Assumed instantaneous loading	--	--	--
Intrinsic Permeability	cm2	Site specific average of samples HS-1 through HS-4 @ 16 fbg	2.40E-08	2.40E-08	2.40E-08
Organic Carbon Content, TOC	[%]	Ratio of TOC in two layers, no input for first layer	--	--	--
Adsorption coeff., Kd	(ug/g)/(ug/ml)	Calculated by SESOIL model using input values for Koc and TOC	--	--	--
		LAYER 2			
Description		Clay: impacted soil extends from 23 to 26 fbg			
Thickness	cm	3 feet	91	91	91
Number of Sublayers		one	1	1	1
Initial contaminant concentration	[ug/g]	Average contaminant concentration of samples above 10 ug/Kg	0.092	0.036	0.239
Bulk Density	g/cm3	Site specific average of samples HS-2 through HS-4 @ 21 or 26 fbg	1.49	1.49	1.49
Loading	ug/cm2	Assumed instantaneous loading	--	--	--
Intrinsic Permeability	cm2	Site specific average of samples HS-2 through HS-4 @ 21 or 26 fbg	9.44E-10	9.44E-10	9.44E-10
Organic Carbon Content, TOC	[%]	Ratio of average site specific organic carbon content measurements from first and second layers	0.1	0.1	0.1
Adsorption coeff., Kd	(ug/g)/(ug/ml)	Calculated by SESOIL model using input values for Koc and TOC	--	--	--
		LAYER 3			
Description		Sandy silt and silt: impacted soil which extends from 26 to 39 fbg.			
Thickness	cm	13 feet	396	396	396
Number of Sublayers		one	1	1	1
Initial contaminant concentration	[ug/g]	Average contaminant concentration of samples above 10 ug/Kg	0.223	0.035	0.259

Table 8
SESOIL INPUT PARAMETERS FOR PCE, TCE, AND (cis) 1,2-DCE

Parameters	Units	Reference, Assumptions, and/or Comments	PCE	TCE	cis-1,2-DCE
Bulk Density	g/cm3	Site specific average of samples HS-1 @ 36 fbg	1.65	1.65	1.65
Loading	ug/cm2	Assumed instantaneous loading	--	--	--
Intrinsic Permeability	cm2	Site specific average of samples HS-1 @ 36 fbg	3.57E-11	3.57E-11	3.57E-11
Organic Carbon Content, TOC	[%]	Ratio of average site specific organic carbon content measurements from second and third layers	0.4	0.4	0.4
Adsorption coeff., Kd	(ug/g)/(ug/ml)	Calculated by SESOIL model using input values for Koc and TOC	--	--	--
LAYER 4					
Description		Silty sand: impacted soil extends from 39 to 60 fbg.			
Thickness	cm	21 feet	640	640	640
Number of Sublayers		ten (allows conc. dist. within 1 ft. of water table)	10	10	10
Initial contaminant concentration	[ug/g]	Average contaminant concentration of samples above 10 ug/Kg	0.022	0.013	0.072
Bulk Density	g/cm3	Site specific average of samples HS-1 through HS-4 @ 51 or 56 fbg	1.42	1.42	1.42
Loading	ug/cm2	Assumed instantaneous loading	--	--	--
Intrinsic Permeability	cm2	Site specific average of samples HS-1 through HS-4 @ 51 or 56 fbb	8.10E-08	8.10E-08	8.10E-08
Organic Carbon Content, TOC	[%]	Ratio of average site specific organic carbon content measurements from third and fourth layers	1.0	1.0	1.0
Adsorption coeff., Kd	(ug/g)/(ug/ml)	Calculated by SESOIL model using input values for Koc and TOC	--	--	--
GROUNDWATER PARAMETERS FOR MIXING ZONE - SUMMERS MODEL					
Saturated hydraulic conductivity	[cm2/day]	Range for silty sand (Freeze and Cherry, 1979).	864	864	864
Horizontal hydraulic gradient	[-]	Calculated from groundwater elevation contours from April 1996 (McLaren Hart, July 1996)	0.06	0.06	0.06
Thickness of groundwater mixing zone	[cm]	Assumes 10 feet, the approximate saturated length of a typical monitoring well screen interval.	305	305	305
Width of impacted zone perpendicular to groundwater flow	[cm]	Approximate width of estimated lateral extent of impacted soil perpendicular to groundwater flow	5334	1981	2896
Target compound background concentration in groundwater	[ug/ml]	Assumed the regional groundwater is not impacted.	0	0	0
Output from simulation	[ug/ml]	Maximum concentration and time of impact to groundwater	**1.514×10^{-3} ug/ml at year 119**	**1.049×10^{-4} ug/ml at year 55**	**1.044×10^{-2} ug/ml at year 42**

Notes:

[-] = dimensionless	l = liter	mg = milligram
yr = year	ml = milliliter	cm = centimeter
sec = second	mol = mole	m = meter
g = gram	atm = atmosphere	
ug = microgram	fbg = feet below grade	



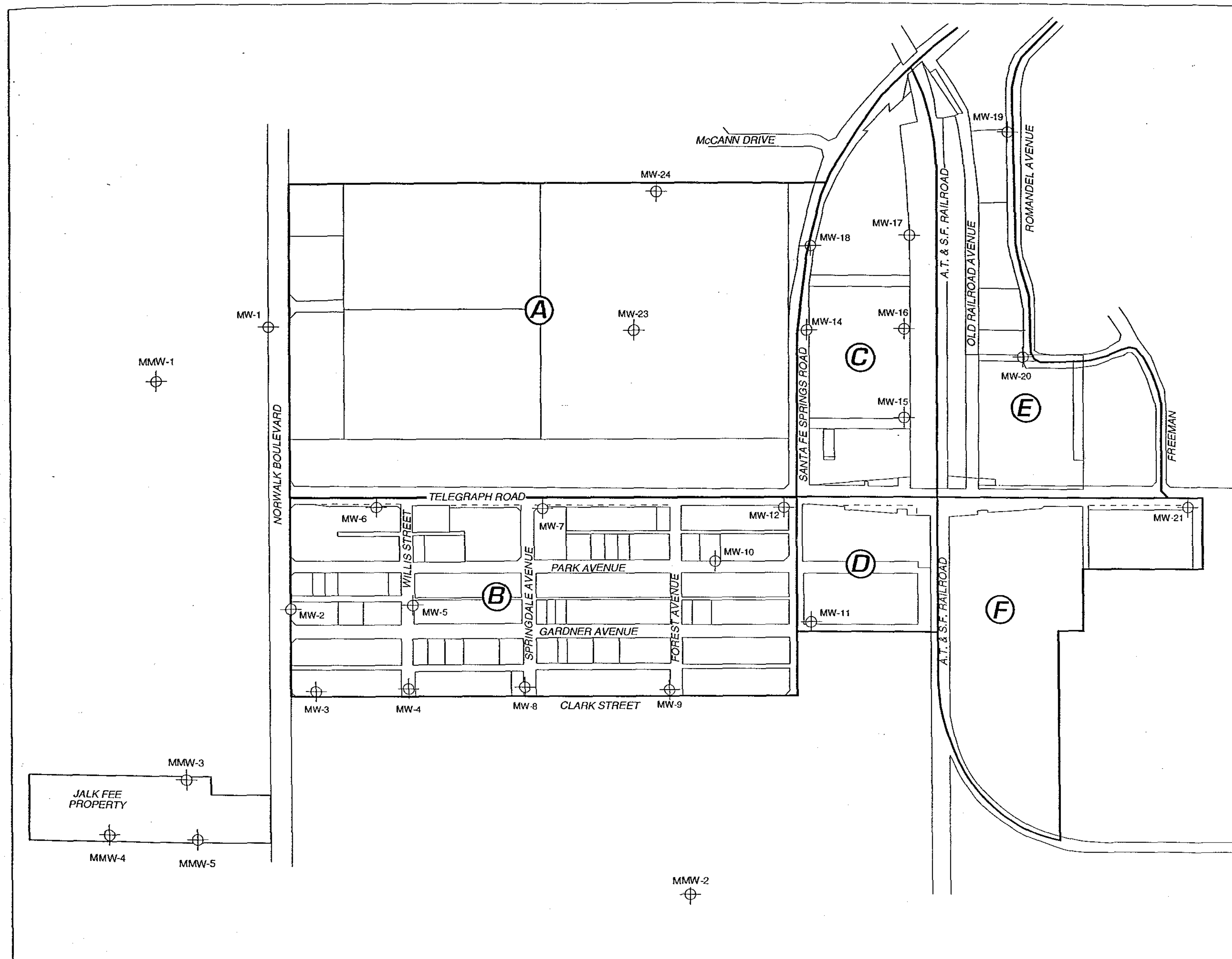
SITE PLAN

Mobil Jalk Fee Property
10607 Norwalk Boulevard
Santa Fe Springs, California

ALTON GEOSCIENCE
Irvine, California

FIGURE 2

23-0134 SITE 10/8/97 fk



LEGEND

MMW-5 Mobil Monitoring Well

MW-24 OFRP Monitoring Well

NOTE:

Areas **A** through **F** are disignations used by the Oil Field Reclamation Project.

SCALE (FEET)

0 500 1,000

Source:
Modified from a map created by McLaren-Hart

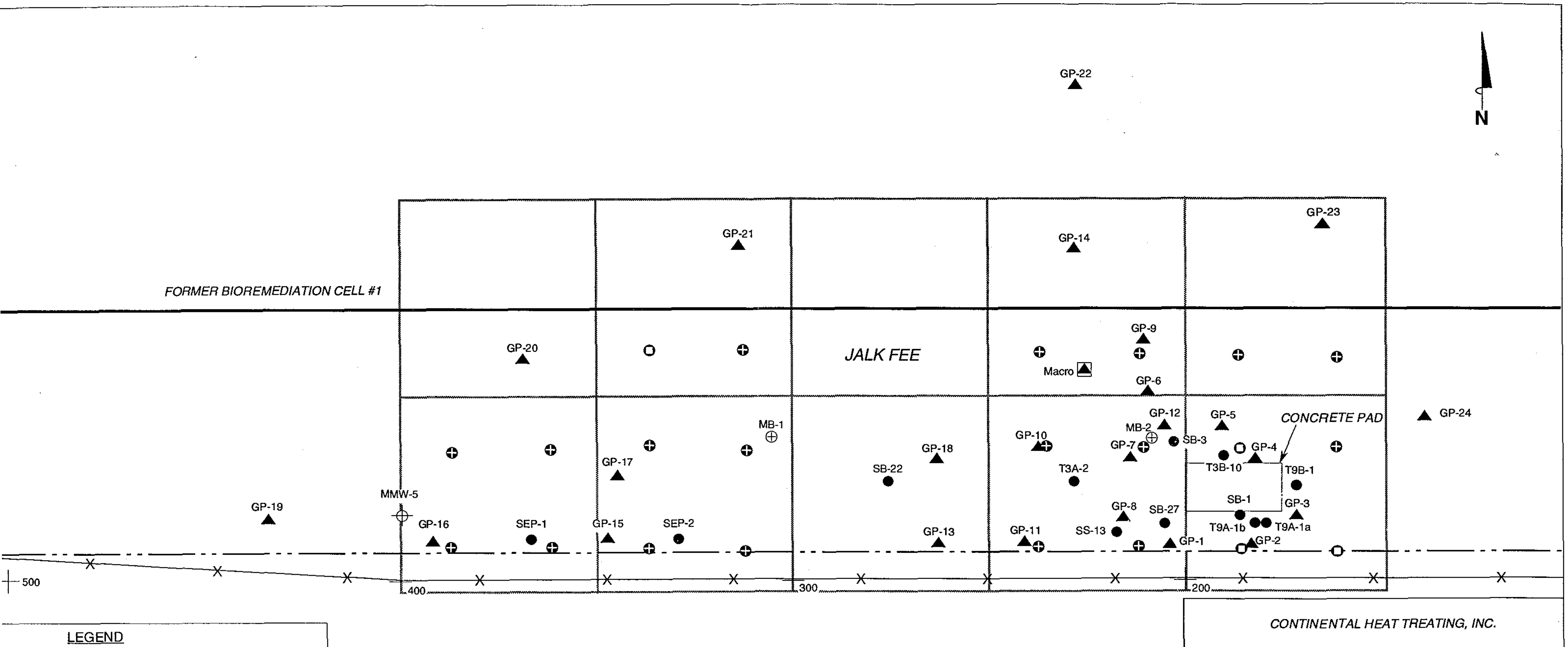
AREA MAP

Mobil-Jalk Fee Property
10607 Norwalk Boulevard
Santa Fe Springs, California

ALTON GEOSCIENCE
Irvine, California

FIGURE 3

23-0134 Area 5/8/97 jrw



LEGEND

MMW-5 Monitoring Well

GP-19 Geoprobe Boring

Macro Continuously Sampled Geoprobe Boring

SEP-2 Soil Boring

MB-1 Hollow-Stem Auger Soil Boring

500 Surveyed Measured Intervals (100 foot)

Chainlink Fence

SCALE (FEET)

0 25

Note: Refer to Figure 2 for map location.

Source:
Modified from a map created by McLaren-Hart

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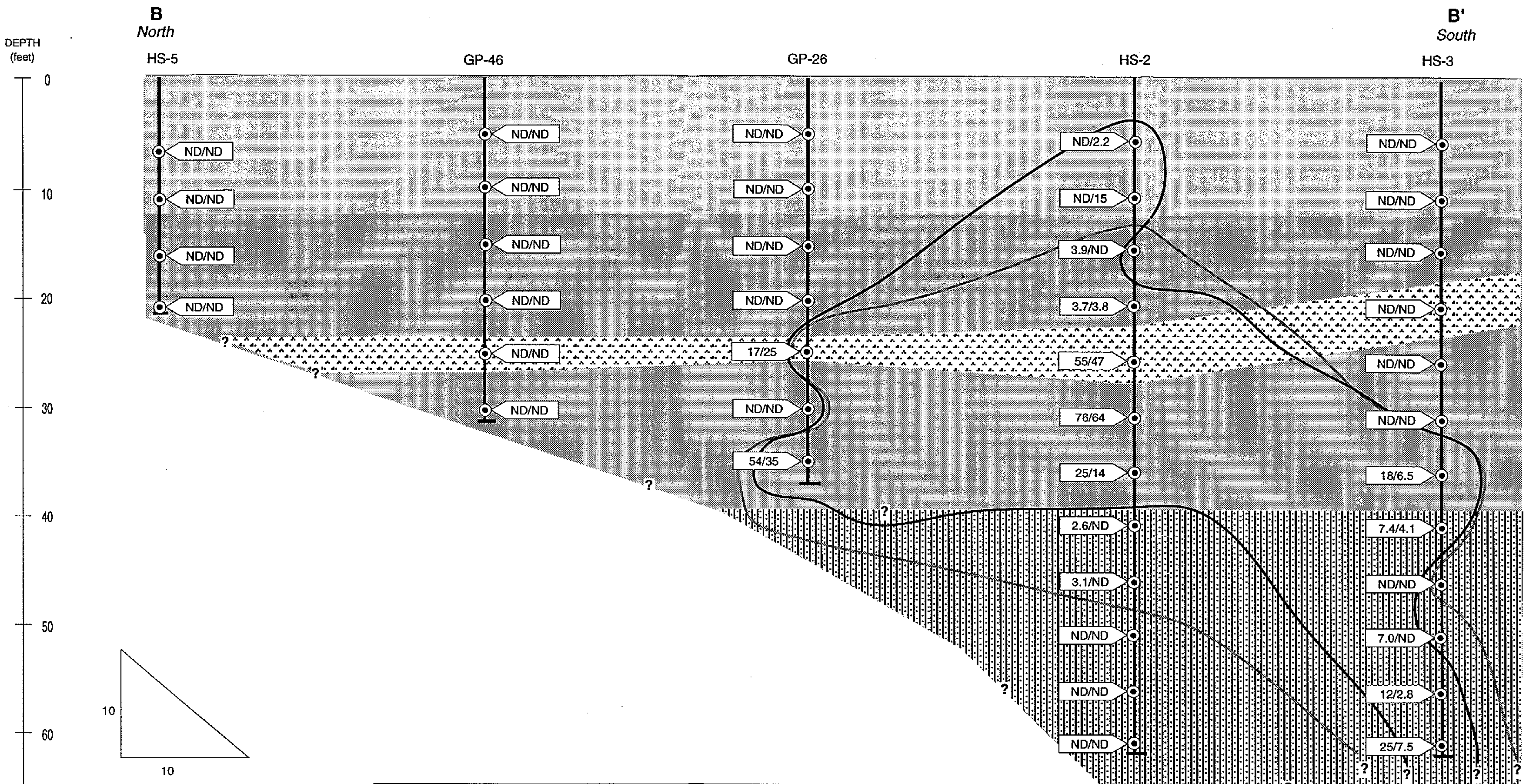
SOIL SAMPLE LOCATIONS FROM PREVIOUS INVESTIGATIONS

Mobil Jalk Fee Property
10607 Norwalk Boulevard
Santa Fe Springs, California

FIGURE 4

23-0134 soil sampl/borings 3/18/97



SCALE (feet)
Vertical exaggeration = 1: 0.83

LEGEND

- Silty Sand (SM)
- Sandy Silt and Silt (ML)
- Clay (CL)
- Sand (SP)
- Inferred extent of TCE-affected soil
- Inferred extent of PCE-affected soil
- ND/ND Soil Sample with PCE / TCE Concentrations (in ppb)
- Total Boring Depth

NOTES:

TCE = trichloroethene.
PCE = tetrachloroethene.
ppb = parts per billion.
ND = not detected at or above method detection limit.
See Figure 5 for map view location of cross section lines.

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CROSS-SECTION B-B'

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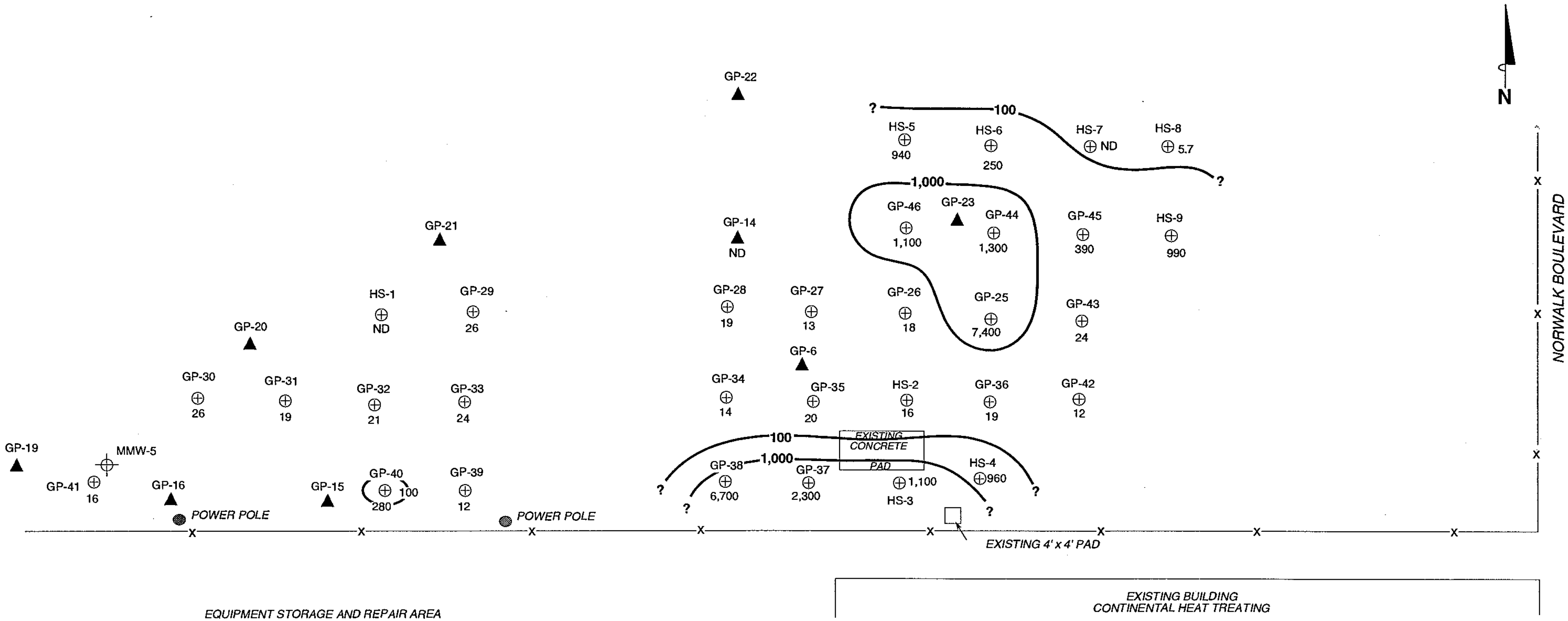
10607 Norwalk Boulevard
Santa Fe Springs, California

FIGURE 6B

23-0134/X-section B-B' 8/28/97



LEGEND

MMW-5	Monitoring Well
GP-41	Boring Location with TRPH Concentration (ppm)
GP-23	McLaren Hart 1994,1996 Geoprobe Boring
x — x	Chainlink Fence
100	TRPH Iso-Concentration Contour (ppm)

SCALE (FEET)

0 30

NOTES:

Contour lines are interpretive based on results of soil samples collected June and July 1997. TRPH = total recoverable petroleum hydrocarbons. ppm = parts per million. ND = not detected at limit indicated on official laboratory report.

Source: Modified from a map created by William A. Teipe and Associates, Inc. Anaheim, California

ISO-CONCENTRATION MAP FOR TRPH IN SOIL AT 5 FEET BELOW GRADE

Jalk Fee Properties
10607 Norwalk Boulevard
Santa Fe Springs, California

FIGURE 7

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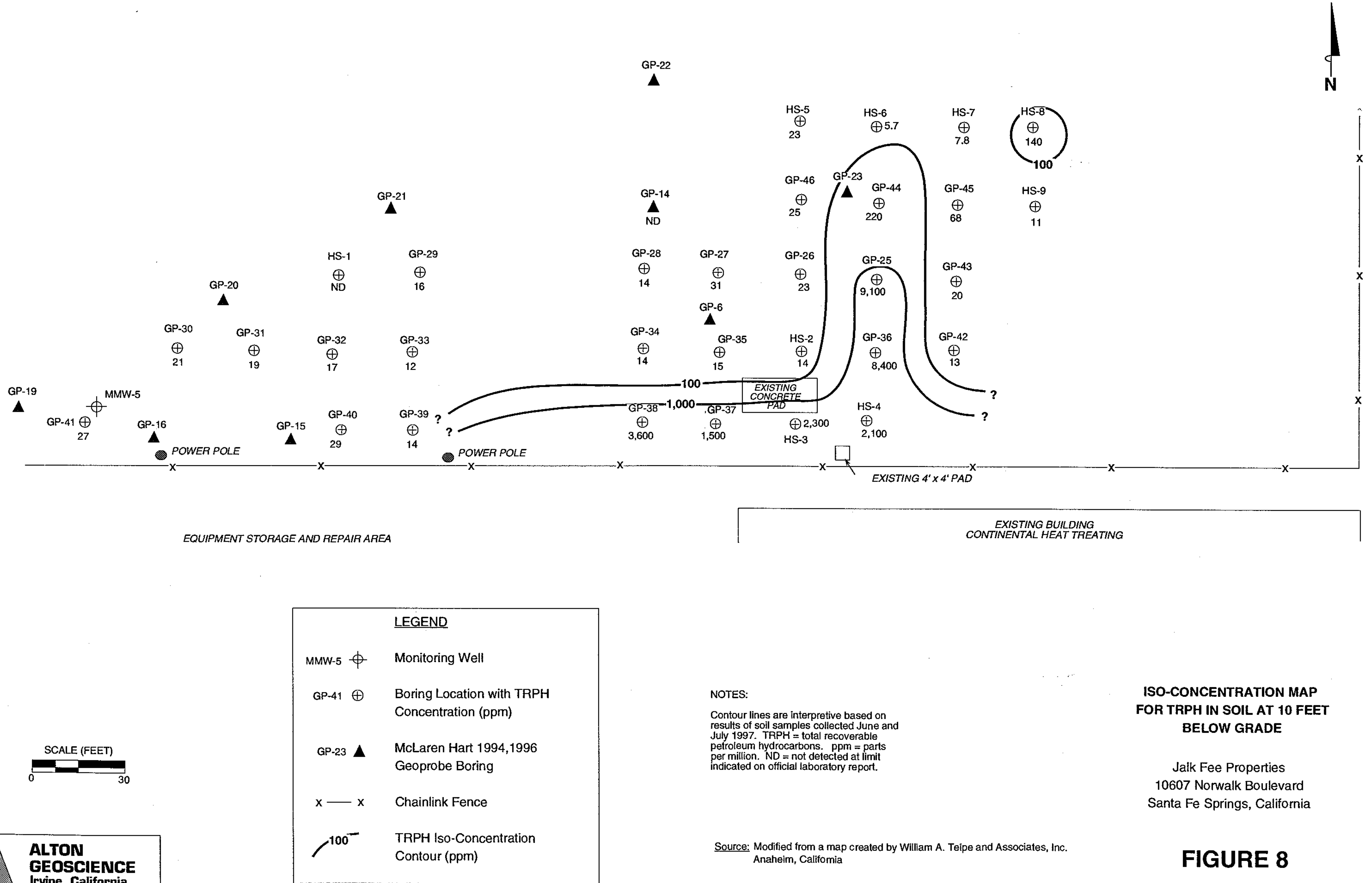
23-0134/base plan 10/3/97 fk



ALTON GEOSCIENCE
Irvine, California

NOTES:

Contour lines are interpretive based on results of soil samples collected June and July 1997. TRPH = total recoverable petroleum hydrocarbons. ppm = parts per million. ND = not detected at limit indicated on official laboratory report.

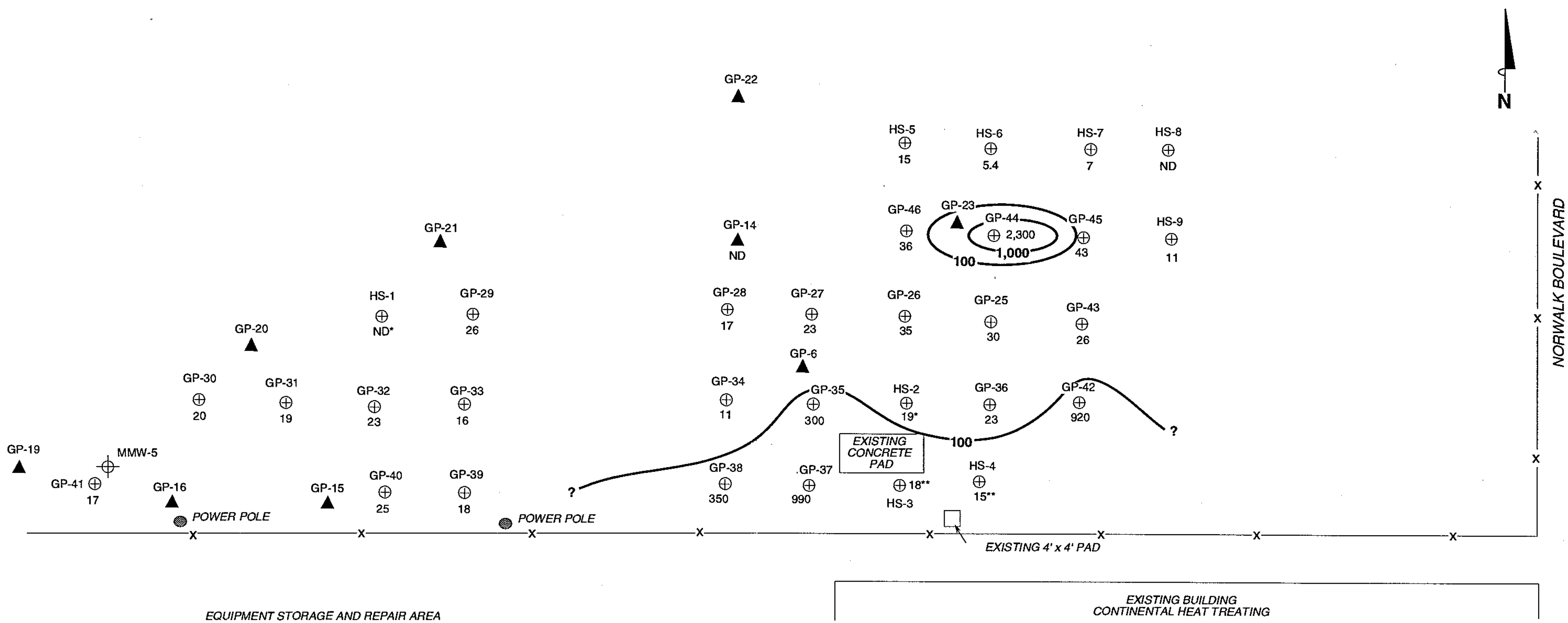
Source: Modified from a map created by William A. Telpe and Associates, Inc. Anaheim, California

ISO-CONCENTRATION MAP FOR TRPH IN SOIL AT 10 FEET BELOW GRADE

Jalk Fee Properties
10607 Norwalk Boulevard
Santa Fe Springs, California

FIGURE 8

23-0134/base plan 10/3/97 fk



LEGEND

MMW-5	Monitoring Well
GP-41	Boring Location with TRPH Concentration (ppm)
GP-23	McLaren Hart 1994,1996 Geoprobe Boring
x —— x	Chainlink Fence
100	TRPH Iso-Concentration Contour (ppm)

SCALE (FEET)
0 30

NOTES:

Contour lines are interpretive based on results of soil samples collected June and July 1997. TRPH = total recoverable petroleum hydrocarbons. ppm = parts per million. ND = not detected at limit indicated on official laboratory report. * = sample collected at 21 feet. ** = sample collected at 26 feet.

Source: Modified from a map created by William A. Teipe and Associates, Inc. Anaheim, California

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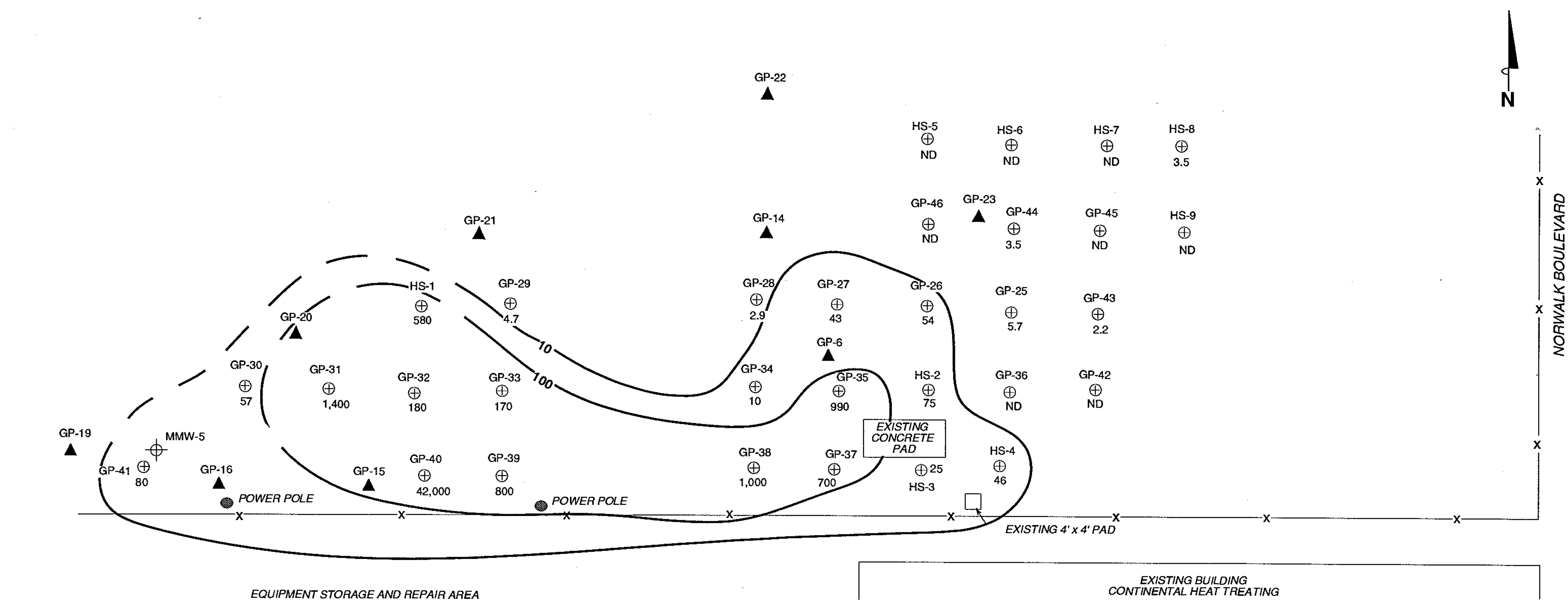
Irvine, California

ISO-CONCENTRATION MAP FOR TRPH IN SOIL AT 15 FEET BELOW GRADE

Jalk Fee Properties
10607 Norwalk Boulevard
Santa Fe Springs, California

FIGURE 9

23-0134/base plan 10/3/97 fk



LEGEND

MMW-5	Monitoring Well
GP-41	Boring Location with PCE Concentration (ppb)
GP-23	McLaren Hart 1994,1996 Geoprobe Boring
x —— x	Chainlink Fence
100	PCE Iso-Concentration Contour (ppb) (Dashed Where Inferred)

SCALE (FEET)
0 30

NOTES:

Contour lines are interpretive based on results of soil samples collected June and July 1997. Includes maximum concentration soil samples from each boring. PCE = tetrachloroethene. ppb = parts per billion. ND = not detected at limit indicated on official laboratory report.

Source: Modified from a map created by William A. Teipe and Associates, Inc. Anaheim, California

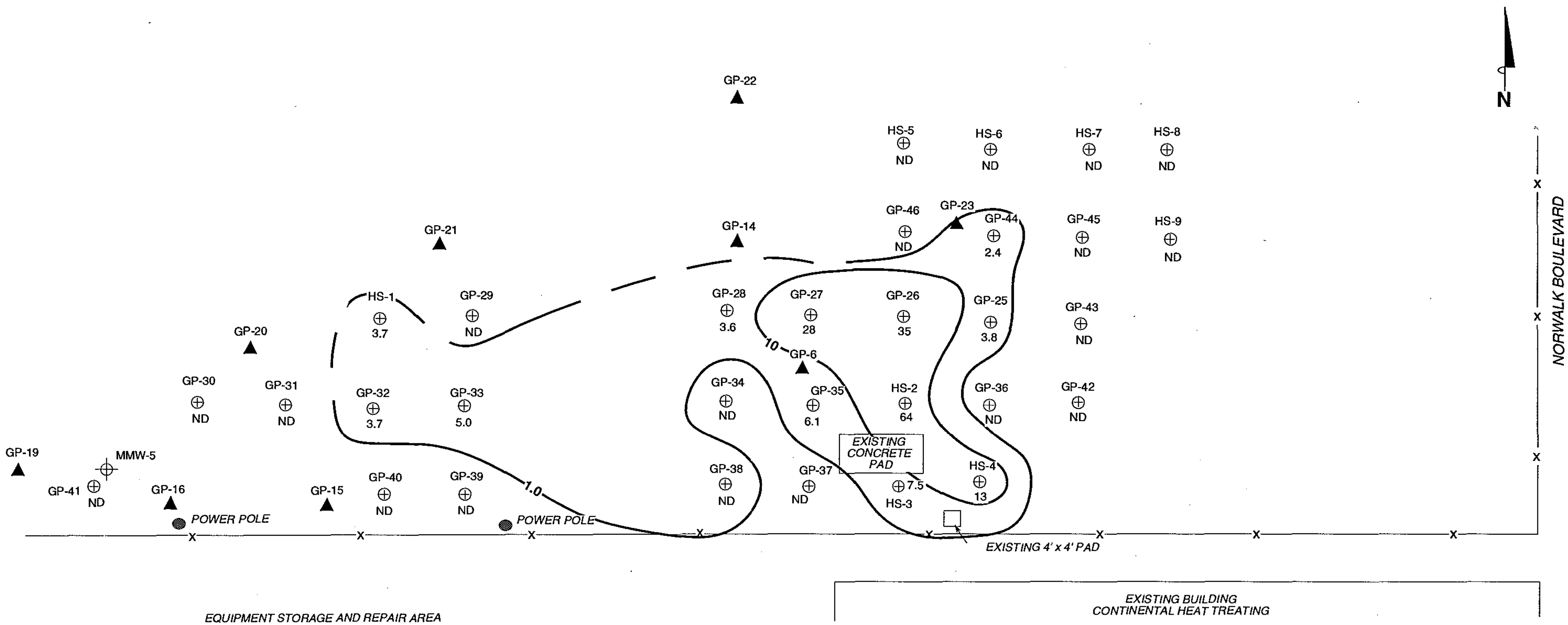
INFERRED LATERAL EXTENT OF PCE-AFFECTED SOIL

Jalk Fee Properties
10607 Norwalk Boulevard
Santa Fe Springs, California

ALTON GEOSCIENCE
Irvine, California

FIGURE 10

23-0134/base plan 10/3/97 fk



LEGEND

MMW-5	Monitoring Well
GP-41	Boring Location with TCE Concentration (ppb)
GP-23	McLaren Hart 1994,1996 Geoprobe Boring
x — x	Chainlink Fence
10	TCE Iso-Concentration Contour (ppb) (Dashed Where Inferred)

SCALE (FEET)
0 30

NOTES:

Contour lines are interpretive based on results of soil samples collected June and July 1997. Includes maximum concentration soil samples from each boring. TCE = trichloroethene. ppb = parts per billion. ND = not detected at limit indicated on official laboratory report.

Source: Modified from a map created by William A. Teipe and Associates, Inc. Anaheim, California

INFERRED LATERAL EXTENT OF TCE-AFFECTED SOIL

Jalk Fee Properties
10607 Norwalk Boulevard
Santa Fe Springs, California

FIGURE 11

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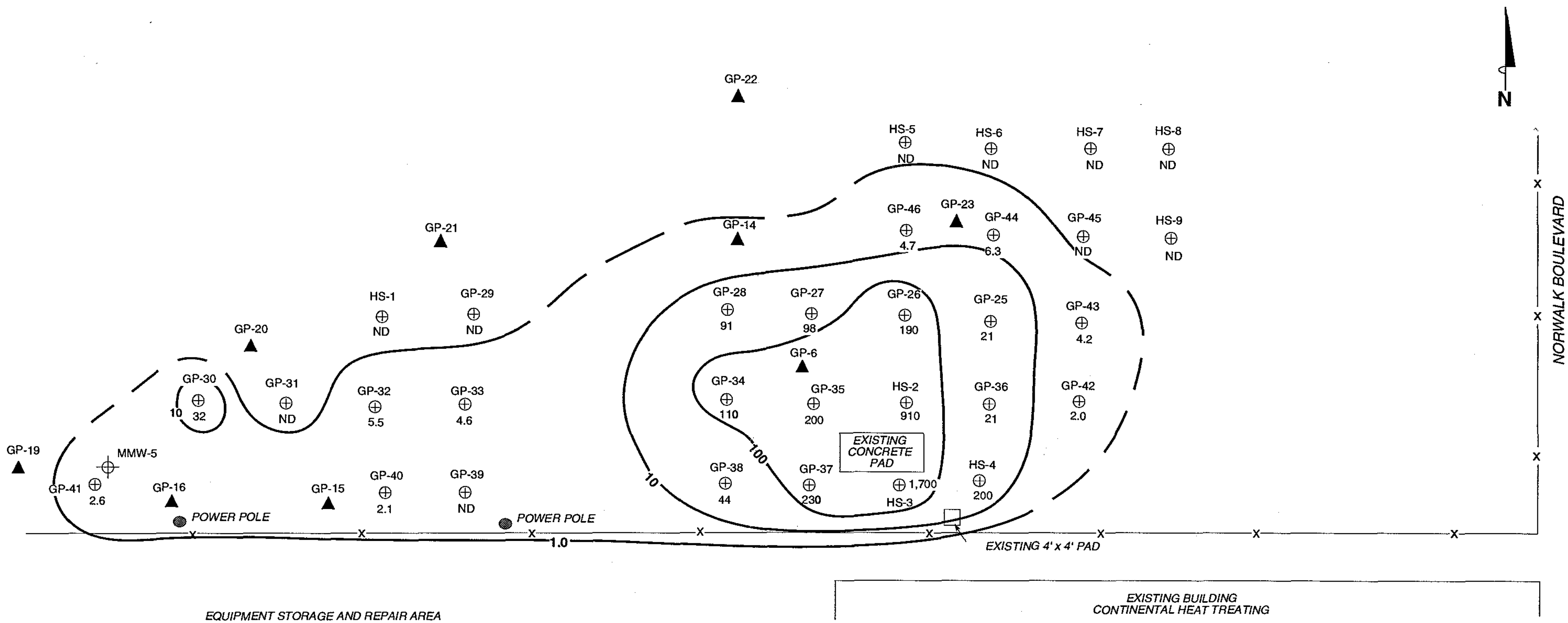
23-0134/base plan 10/3/97 fk



LEGEND

- MMW-5 — Monitoring Well
- GP-41 — Boring Location with (cis) 1,2-DCE Concentration (ppb)
- GP-23 — McLaren Hart 1994,1996 Geoprobe Boring
- x —— x — Chainlink Fence
- 100 — (cis) 1,2-DCE Iso-Concentration Contour (ppb) (Dashed Where Inferred)

SCALE (FEET)
0 30

NOTES:

Contour lines are interpretive based on results of soil samples collected June and July 1997. Includes maximum concentration soil samples from each boring. (cis) 1,2-DCE = cis 1,2-dichloroethene. ppb = parts per billion. ND = not detected at limit indicated on official laboratory report.

Source: Modified from a map created by William A. Teipe and Associates, Inc. Anaheim, California

INFERRED LATERAL EXTENT OF (cis) 1,2-DCE-AFFECTED SOIL
Jalk Fee Properties
10607 Norwalk Boulevard
Santa Fe Springs, California

FIGURE 12

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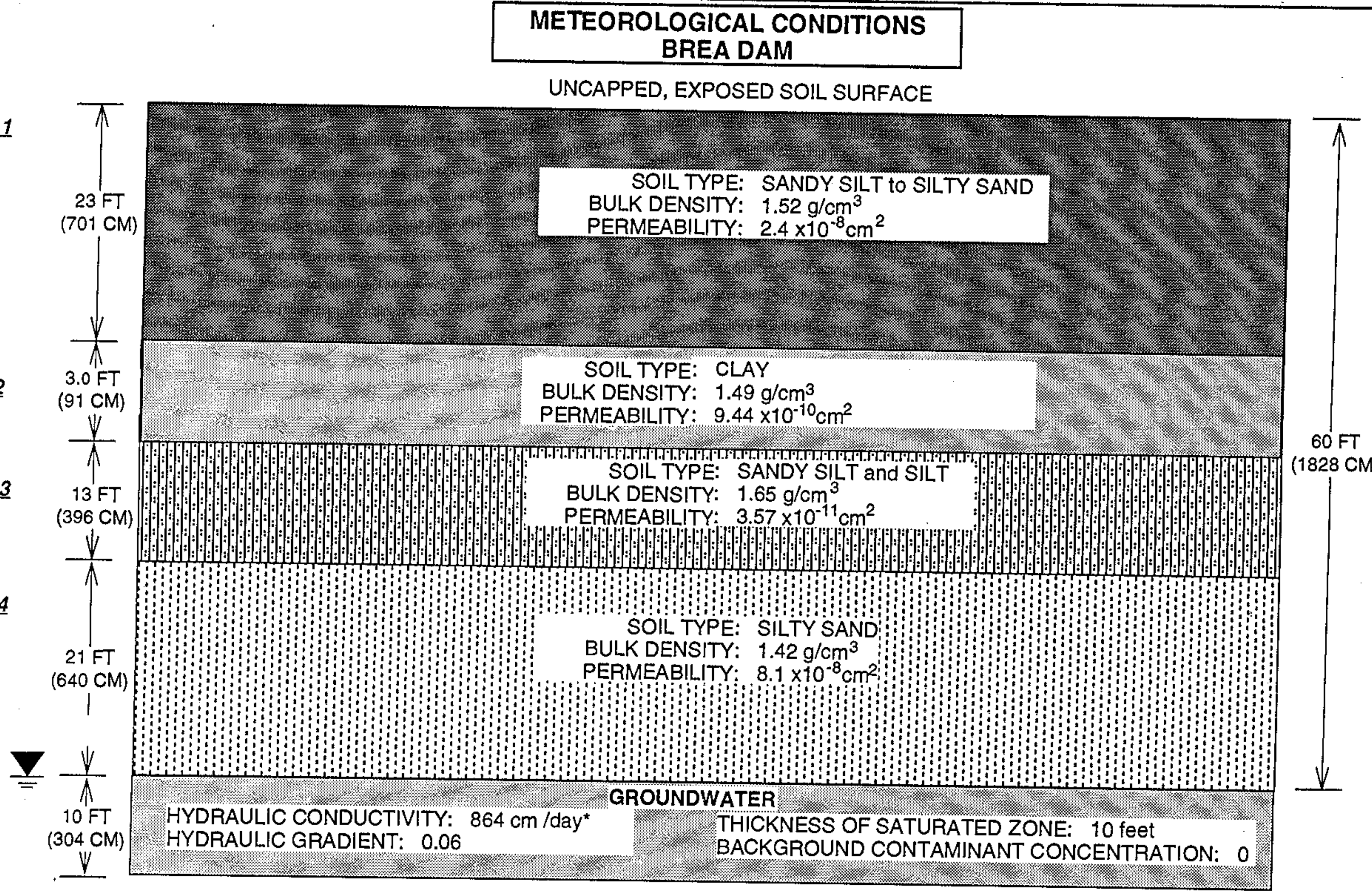
Irvine, California

23-0134/base plan 10/3/97 fk



ALTON GEOSCIENCE
Irvine, California

CONCEPTUAL OVERVIEW OF SESOIL MODELING

Jalk Fee Properties
10607 Norwalk Boulevard
Santa Fe Springs, California

FIGURE 14

35-0134 Conceptual Model 12/7/95